

**RIVER AND HARBOR BILL WILL PROBABLY PASS**

Hon. T. E. Burton, chairman of the committee on rivers and harbors of the house of representatives, is confident that the river and harbor bill will pass notwithstanding the opposition to it in certain quarters. Certainly if it does not pass there will be serious delay in important improvements in all parts of the country. Mr. Burton in the report accompanying the bill says that the amount appropriated for expenditures during the fiscal year ending June 30, 1906, is \$17,121,875.41. From this amount there should be deducted the unexpended balance appropriated by the act of April, 1904, amounting to \$2,188,942, leaving the net additional appropriation \$14,932,933.41. In addition the bill appropriates \$17,234,657.63 to be expended after June 30, 1906, making the total appropriation \$32,167,591.04. Following are the provisions for the harbors of the great lakes:

Erie, Pa., \$125,000; Toledo, \$20,000; Port Clinton, O., \$2,000; Sandusky, \$125,000; Huron, \$68,500; Vermillion, \$15,000; Lorain, \$85,000; Cleveland, \$200,000; Fairport \$135,000; Ashtabula, \$20,000; Conneaut harbor, \$60,000; Ontonagon, Mich., \$3,000; Marquette, \$3,000; Marquette bay harbor of refuge, \$1,000; Grand Marias, Mich., \$50,000; Gladstone, Mich., \$14,000; Manistique, Mich., \$25,000; St. Joseph, Mich., \$15,000; South Haven, Mich., \$50,000; Holland, Mich., \$65,000; Grand Haven, Mich., \$30,000; Muskegon, Mich., \$100,000; Pentwater and White Lake, Mich., \$20,000; Ludington, Mich., \$10,000; Manistee, Mich., \$10,000; Frankfort, Mich., \$20,000; Charlevoix, \$25,000; Petoskey, Mich., \$20,000; Arcadia, Mich., \$6,000; Cheboygan, Mich., \$7,500; Harbor Beach, Mich., \$200,000; improving waterway across Keweenaw point from Keweenaw bay to Lake Superior, \$45,000; Grand River, Mich., \$100,000; Saginaw, Mich., \$30,000; Monroe harbor, Mich., \$13,000; Clinton river, Mich., \$3,000; St. Mary's river, \$420,000; Hay lake and Neebish channel, \$500,000; Detroit river, \$400,000; Kenosha, Wis., \$5,000; Racine, Wis., \$30,000; Milwaukee, Wis., \$150,000; Sheboygan, Wis., \$18,000; Manitowoc, Wis., \$110,000; Two Harbors, Wis., \$6,600; Kewaunee, Wis., \$3,000; Sturgeon Bay and Lake Michigan ship canal, \$50,000; Green Bay, Wis., \$10,000; Ashland, Wis., \$60,000; Port Wing, Wis., \$19,992; Fox river, Wis., \$35,000; Grand Marias, Minn., \$2,000; Agate bay, Minn., \$2,000; Duluth and Superior, \$270,000; Michigan City, Ind., \$45,000; Chicago, \$200,000; Waukegan, Ill., \$30,000, improving Calumet river \$100,000.

The bill authorizes the secretary of war to appoint a board of engineers to inquire into the effect of wave action as injuriously affecting the harbors of Ludington, Manitowoc, Two Harbors, Racine, Kenosha and Sheboygan.

**SHIP BUILDING AT BATH DURING 1904**

Ship builders in the Bath district are now taking their reckonings and find that the ship building output has been about even for the past two years. The ship building boom which began during McKinley's first presidential term and which was directly attributable to the war with Spain is about over. The history of ship building in the Bath district during the past four years has been as follows:

	1900.		1901.		1902.		1903.		1904.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Schooners .....	15	23,731	15	18,074	15	16,048	15	16,516	16	21,161
Barges .....	13	13,623	8	7,996	6	9,282	6	8,302	6	4,741
Steamers .....	4	3,292	1	181	2	2,304	.....	.....	.....	.....
Ships .....	1	850	2	6,662	1	3,381	.....	.....	.....	.....
Tugs .....	.....	.....	1	650	1	110	.....	.....	.....	.....
Yachts .....	.....	.....	.....	.....	1	538	.....	.....	2	38
Steam Lighter .....	.....	.....	.....	.....	.....	.....	1	251	.....	.....
Sloop .....	.....	.....	.....	.....	.....	.....	.....	.....	1	68
Totals .....	.....	41,496	.....	33,563	.....	31,663	.....	25,149	.....	26,008

**VESSELS LAUNCHED IN BATH CUSTOMS DISTRICT FOR THE YEAR 1904.**

Rig.	Name.	Builders.	Gross Ton.	L'gth	B'dth	D'th
Sch'r.	James B. Drake ..	New England Co.	1153	196.3	39.6	18.4
Sloop.	Umbagejus .....	Percy & Small ..	68	70.5	22.2	5.6
Barge.	Beattie .....	Kelley, Spear Co.	1117	221.5	35.5	18.5
Sch'r.	Frontenac .....	Kelley, Spear Co.	1704	225.5	43.9	19.8
Sch'r.	Ant'ny D. Nichols ..	Kelley, Spear Co.	680	172.0	36.6	13.5
Sch'r.	Magnus Manson ..	New England Co.	1751	223.0	43.2	22.0
Sch'r.	Wm. C. Bowen, Jr. ..	New England Co.	656	172.3	36.5	13.5
Sch'r.	Louis Bossert .....	Kelley, Spear Co.	605	169.6	36.9	12.8
Yacht.	Waywassimo .....	C. B. Harrington ..	23	54.4	12.1	4.8
Sch'r.	Wm. J. Quillan .....	New England Co.	695	176.7	37.4	13.8
Barge.	Horace A. Allyn .....	Kelley, Spear Co.	859	190.6	35.2	16.3
Sch'r.	Grace A. Martin ..	Percy & Small ..	3129	302.2	48.1	28.6
Sch'r.	Julia P. Cole .....	F. S. Bowker & Son	495	155.8	34.7	12.1
Yacht.	Nokomis .....	N. Blaisdell & Son	15	43.6	13.1	5.3
Barge.	Chas. F. Prichard ..	Kelley, Spear Co.	861	190.0	35.3	16.1
Barge.	Berkeley .....	Kelley, Spear Co.	650	180.7	36.1	12.4
Sch'r.	Marcas L. Urann ..	C. V. Minott, Jr. ..	1899	251.7	44.3	24.1
Sch'r.	Judge Boyce .....	New England Co.	698	177.8	37.4	13.5
Sch'r.	Geo. W. Truitt, Jr. ..	New England Co.	779	187.0	38.1	13.3
Barge.	John Bossert .....	Kelley, Spear Co.	601	170.7	36.0	12.8
Sch'r.	Persis A. Colwell ..	F. S. Bowker & Son	516	160.5	35.2	12.0
Sch'r.	Ruth E. Merrill ..	Percy & Small ..	3003	301.0	48.2	23.7
Barge.	Bristol .....	Kelley, Spear Co.	653	180.8	36.3	12.4
Sch'r.	Mary L. Newhall ..	Elwell S. Crosby ..	1310	209.1	40.2	21.6
Sch'r.	Do'thy B. Barrett ..	Gard'r G. Deering	2088	259.5	45.4	25.1

No. 2 ore dock of the Great Northern Co. at Allouez bay, is out of plumb. A list of about 12 in. has been discovered in the structure forward from end to end. The dock is one of the largest in the world. The trouble is supposed to have been caused by the rush of heavy ore trains, which have subjected it to enormous strain. The dock is set upon 13,000 piles and has in its construction 14,000,000 ft. of timber. It is 1,537 ft. long and stands 73 ft. above the water line.

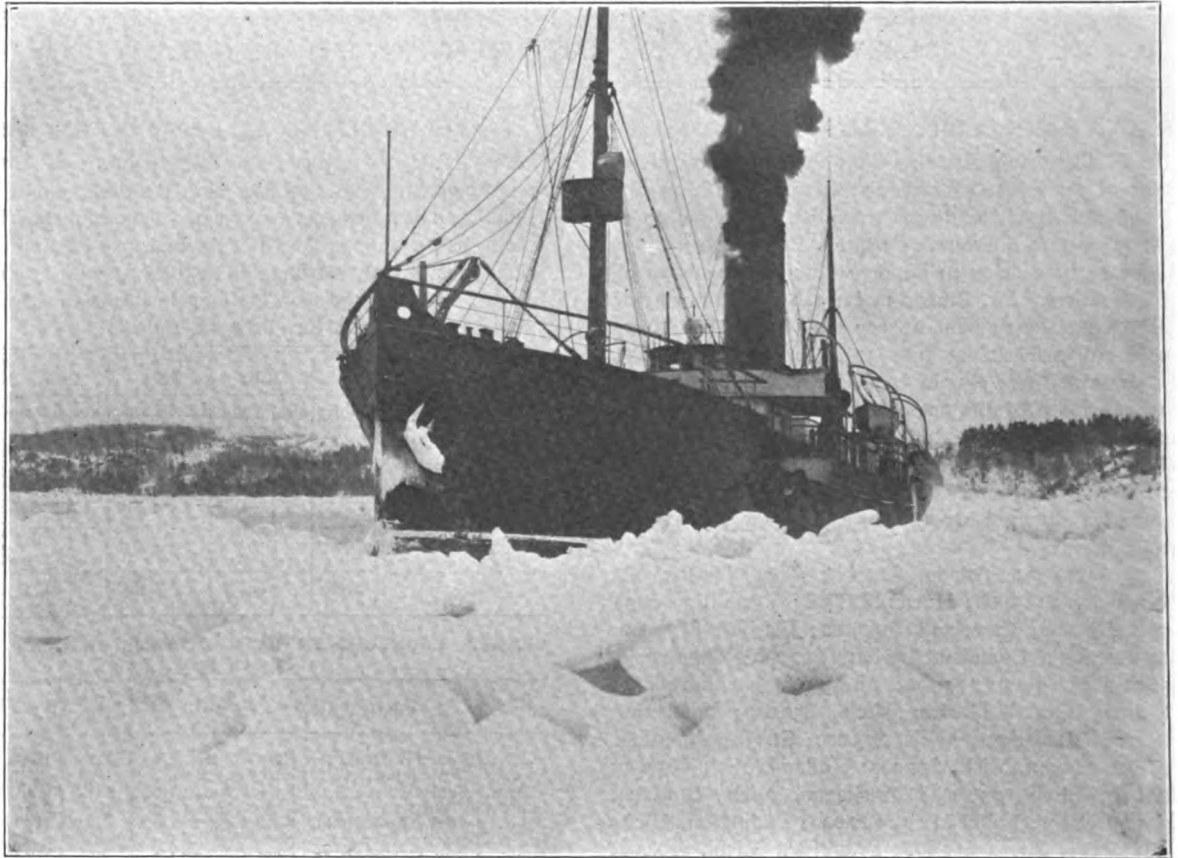
# Ice Breakers on Lower St. Lawrence

By G. M. Fairchild, Jr.

The earlier opening of the lower St. Lawrence river and the later closing of that artery of marine commerce has engaged the attention of the large shipping interests of the dominion of Canada for some years past. If navigation of the river could be maintained for two weeks later in the fall and opened two weeks earlier in the spring it meant a clear gain of one month which in these days of steamers and close figuring on ocean freights is one of considerable magnitude. Between the ports of Montreal and Quebec, however, there are physical conditions that render the solution of this problem one of no ordinary difficulty. Ninety miles below Montreal the river expands into a considerable body of water

To the Hon. R. Prefontaine, minister of marine for the dominion of Canada, a man of large and progressive ideas, belongs the credit for initiating an ice-breaking service on the St. Lawrence that is destined to effect a material lengthening of the season of navigation on this great highway of commerce.

The Montcalm, the new ice-breaker, is a schooner-rigged twin screw steamer built to the highest requirements of Lloyds' Register of Shipping, and in conformity with the Canadian rules for shipping and board of trade requirements. She is a two-decker with top gallant forecabin, the upper deck running from right aft to the forward side of the



THE MONTCALM WORKING IN HEAVY PACKED ICE.

known as Lake St. Peter. Except for the steamer channel it is a shoal on which the ice forms very early—oft-times in November. For several weeks this ice is shifting with every wind and current and so great is its force that anchored buoys of every description that mark the ship channel have to be early removed to save them from being carried away. These removals put an end to navigation. Again at Cap Rouge, some 6 miles above Quebec, the St. Lawrence narrows to some 2,000 ft. with a seven hours' ebb tide of about 6 miles an hour. Large ice fields coming down with the tide catch at this point and precipitate an ice jam. This jam in many years becomes a fixture for the winter months and occasionally it is well into May before it breaks up.

Below Quebec the ice impediment to late fall and early spring navigation of the river is never quite so serious as above this city. The immense width of the river prevents its freezing over, and nothing more serious than drifting field ice is to be met with.

bridge. Her dimensions are: Length, 245 ft. between perpendiculars; beam, 40 ft. 6 in.; depth, molded, 18 ft.

The hull is constructed in the most improved principle with cellular double bottom, and is divided by specially strong transverse bulkheads into five watertight compartments. The double bottom is divided, both longitudinally and transversely into six separate compartments, which, with the large tanks in the fore and aft peak, are arranged to be filled or pumped out at will, so that the trim of the vessel may be quickly and safely altered to any conditions required for working in the ice fields. The fore foot is cut away, and the stern specially shaped for forcing a passage through ice, and, in this connection, it is worth mentioning, that the stern and rudder—rudder parts are made particularly heavy to resist the strains encountered at this work. For a considerable distance fore and aft the bottom plating is very heavy, and a double thickness of plates is run from stem to stern, above and below the water level—backed up by a system of double



framing, and heavy stringer bars and keelsons.

Advantage has been taken of working into the hull the shaft tunnels and large fresh water tanks with a liberal supply of heavy stanchions in holes to further strengthen the vessel. The steel propellers with their

shafts are carried by a strong cast steel spectacle frame worked into the hull and attached to the stern post which is fitted with a special protection cast solid with it to prevent injury to the rudder stock, and to cut a way through ice.

A spacious bridge is built over a deck house forward of the machinery space. On this bridge is the wheel house, fitted with Lord Kelvin's most improved compass, quarter-masters standard controlling the steam steering gear placed in engine room; Chadburn's latest time repeating engine telegraph and speaking tubes to the crow's nest in foremast, the chart room and engine room. On top of the wheel house is the Standard compass, also by Lord Kelvin, and on the bridge is another twin engine telegraph and the lanyards for working the powerful organ whistle and syrens.

On the forecastle head a large steam windlass is fitted for raising the two self-stowing anchors and right aft is a powerful steam capstan. In addition to the steam steering engine which operates a heavy built steel quadrant in the rudder stock, a 6-in. screw gear with hand purchase is provided, with a Kelvin compass before it. The two steel masts are arranged in way of the hatches over holds, fore and aft, and are provided with steam winches and derricks heavy enough to deal with any weight met with in the special service of this steamer. On the foremast, high up, a crow's nest with powerful search light, is fitted for navigating narrow water at night time. In the deck house under bridge is an elegantly fitted chart room, with captain's state room and lavatory on the starboard side,



THE MONTCALM WORKING IN ICE JAM OFF CAP ROUGE.

Further aft is another deck house, having two well fitted cabins on either side, for the lighthouse inspector and official respectively. Leading from each room access is given to a

bath room and lavatory fitted with hot and cold water.

From the deck house under bridge a double stairway, handsomely fitted in mahogany, leads to the saloon and main deck. The saloon extends from side to side of the ship and is quite a feature of the ship. The sides are richly panelled in mahogany with a large number of lights all around. On each side is a table with settees and chairs in blue plush velvet, with steam heaters running around, and a handsome radiator in center. A well arranged system of electric lights add to the beauty of a thoroughly handsome saloon. Doors, port and starboard lead to the state rooms on each side of the ship. In the center an elaborately fitted stateroom for guests, well lighted from above by an ornamental skylight.

On the starboard side are several staterooms, a lavatory fitted in white marble and bath rooms. Further aft is the steward's pantry, communicated by means of a lift with the large galley on upper deck. Further aft is the engineer's toilet room, ice box and steward's store. On the port side leaving the saloon is a neat ladies' cabin with lavatory, etc., attached and further aft the passage leads to several well fitted



ICE BREAKER MONTCALM SHOWING SHAPE OF BOW.

double state rooms.

From the deck house aft a passage and stairway leads to the engineers' quarters on the main deck, with accommodation for petty officers, and two mess rooms and steward's

and chief and second officers' rooms on side. The engine casing above the upper deck is continued aft to provide a neat smoking room on the starboard side with the third officers' room alongside. On the port side is the purser's room suitably fitted out.



pantry. Right aft is a commodious store for ship's provisions. In the forecabin, accommodation on a liberal scale is provided for petty officers and crew, and on the main deck for working party with the latest sanitary arrangements.

The vessel throughout is provided with electric light and oil lamps in case of emergency, and an elaborate system of steam heating on the most improved principle provides for the comfort of the crew in cold weather. The sanitary arrangements are supplied with water from a large tank continuously fed from the engine room.

The machinery consists of two sets of inverted vertical direct-acting triple-expansion engines having cylinders  $23\frac{1}{2}$ , 38 and 64 in. in diameter respectively, with a stroke of 42 in. They are of the most modern semi-navy type and are fitted with every improvement to secure the greatest efficiency and economy in working.

From the entrance to the engine room on either side, at the level of the upper deck, a fine view is obtained of the powerful and well proportioned cylinders which are each provided with special steam jackets for use in cold weather.

At the aft end of the engine room on this level, a very powerful steam steering engine, made by Messrs. Alley & McLellan of Glasgow, is fixed, being controlled by means of gearing by the quartermaster stationed in the wheel house on bridge. From the platforms around cylinders a well arranged system of ladders leads down to the starting platform where the levers for controlling the engines are situated. Here the view obtained of the engines with their massive shining wrought iron columns and moving parts gives an excellent idea of the enormous power concentrated in them.

At the forward end a special feature is the compact arrangement of the starting levers and wheels which make it possible for the one engineer on watch to have absolute control of both engines; material assistance in this direction is afforded by the improved direct-acting reversing engines fitted by the makers.

The auxiliary engines are two powerful centrifugal pumps providing the circulating water for condensers, Weir's latest type of feed water heater, feed water filter, and evaporator, capable of providing 15 tons of fresh water per day for the boilers, and powerful duplex feed pump. At the aft end of the starting platform another powerful pump is arranged for pumping out water ballast and moving the ballast from any one position of the vessel's double bottom to another, so that the trim of vessel may be quickly altered to suit the varying conditions when working in the ice fields.

In either wing two dynamos are fitted, the smaller arranged to provide light to the machinery space and officers' accommodation, and the larger will be used for lighting up the whole ship, and powerful searchlight fitted in the crow's nest on the foremast. At the aft end of the engine room access is given to the shaft tunnels through a watertight door. These tunnels are lighted by electricity and are of more than usual size to ensure complete accessibility.

Through the air lock at forward end of engine room one comes to the boiler room. There are four large water tube boilers, made by the well known Babcock & Wilcox firm. They are in all respects the same as fitted on the latest type of ships of the British navy. They are in two groups in two stokeholds, one forward and one aft, having a total grate surface of 3,49 sq. ft., and 12,800 sq. ft. of heating surface, capable of evaporating under assisted draft 61,500 lbs. of water at a steam pressure of 200 lbs. per sq. in.

To assist the draft two large single-acting fans are provided, each capable of supplying 18,000 cu. ft. of fresh air per minute to the furnaces. For moving the coal from the bunkers at the forward end of the boiler room to the furnace a narrow gauge railway runs fore and aft the boiler room with suitable truck mountings.

In the aft stokehold a See patent hydraulic ejector throws

the ashes clear away from the ship's sides, absolutely free of all the noise or dirt usually associated with the operation of getting rid of ashes. In conclusion it may be stated that when the engines are working under normal conditions they will develop about 3,600 H. P. running at 90 revolutions per minute and will be capable of working up to about 4,500 H. P. at 110 revolutions per minute under forced draft.

Messrs. Fleming & Ferguson, who constructed the machinery, have established a record for quickness of despatch, in this instance. They received the order for the Montcalm on June 24, 1904. They prepared entirely new designs and patterns, the hull was launched on Oct. 14, by which time the first set of engines were completed in the erecting shops. The second set were completed on Oct. 21, and on Nov. 5 the whole of the machinery and boilers, weighing upwards of 400 tons, were tried under steam. By Nov. 12 the last finishing touch had been given to everything and the Montcalm, constructed under the able supervision of Capt. McIlhiney, nautical advisor to the Canadian government, was ready to proceed on her trials seven days before the stipulated time.

Since the Montcalm's arrival at the port of Quebec she has been in active service and her capacity as an ice-breaker has had to stand a severe test. The present winter set in early and with extraordinary severity. Ice jams were almost of daily occurrence at Cap Rouge and it was the work of the Montcalm to break them. Capt. Koenig, her commander, has had about thirty years of experience of St. Lawrence river conditions, but ice-breaking in heavy tidal waters and an unbuoyed river with an untested steamer was a novel experience. The captain's successful handling of the steamer and his extraordinary success in combating ice floes and ice jams has proven the wisdom of his superiors in appointing him to this work. On Jan. 8 of the present year a more than usually heavy ice jam occurred during the night at Cap Rouge, and before the Montcalm could reach the scene it had become permanently fastened. In many places outside the channel the ice grounded in 60 ft. of water, while in the channel the ice was anywhere from 20 to 30 ft. thick. One of the photos illustrating this article shows the Montcalm cutting out sections of this jam. It is not expected that she will entirely release it during the winter, but she has destroyed the key so that at the end of March her work will be materially lessened when she again attacks the main body then weakened by attrition of water and sun rays. Though ordinary ice floes up to 12 or 15 in. thick the Montcalm moves serenely on without apparent effort. It is a most interesting sight to see her cutting through this form of ice. In attacking ice jams, however, her captain resorts to clever tactics. Instead of running the steamer head on to the jam, which would hang her up on the ice, Capt. Koenig takes her in on an angle. Meeting the heavy obstruction the steamer sidles outward toward the open water but not before a considerable section of ice has been broken away. By repeated attacks of this kind, on the ebb tides, large bodies of this heavy ice is released and carried off. It would be quite possible for the Montcalm to break up the present jam at Cap Rouge within a month by the methods pursued, but it has been decided upon that the gain for the moment was not commensurate with the work required, but at the end of March the Montcalm may be confidently relied upon to free the river of all ice obstruction between Quebec and Montreal and give two weeks earlier navigation for all incoming or outgoing craft.

This article would be incomplete in every way were I not to mention the fact that the present minister of marine, Hon. R. Prefontaine, is particularly fortunate in his deputy, Lieut. Col. Gourdeau, who has been untiring in his effort to make the present service an entire success, as has J. U. Gregory, esq., the agent of the marine department at Quebec for forty years past. Mr. Gregory probably possesses a more



complete knowledge of St. Lawrence river navigation and requirements than any other living man and last year, in recognition of his devotion for all the long years to the service, his majesty King Edward made him a companion of the imperial service order, one of the highest honors he could confer. Mr. Gregory is as active and as enthusiastic a worker to day in behalf of the St. Lawrence route as he was forty years ago and his services are appreciated to the full by his superiors at Ottawa as well as by the shipping community. Earlier in this article I should perhaps have stated that the marine department at Ottawa established a signal service at Cap Rouge in the early part of the present winter to keep the steamer Montcalm in daily, and if necessary, hourly communication with ice conditions, or to report steamer's work direct to agent in Quebec or at Ottawa. The work at this station will become of considerable importance as the season advances.

### LIVERPOOL SHIPPING LETTER

Liverpool, Feb. 13.—The Manchester Ship Canal Co. has just issued its half-yearly report to the end of December, 1904. The directors state that the receipts amounted to \$1,007,475 and the expenditure to \$609,699, leaving a balance of \$387,780. The total profit on the half year's working was \$52,015. This sum enabled the directors to pay the interest due upon the first and second mortgage debentures, the mortgage on surplus lands, etc., and there was a balance remaining of \$318,550, which has been paid to the corporation of the city of Manchester, on account of interest due on the debentures they hold. The total amount paid to the corporation in respect of the whole of 1904 was \$538,570. The weight of toll-paying merchandise which passed over the ship canal during the last half year was: Sea-borne traffic, 1,868,465 tons, compared with 1,859,303 tons in the corresponding half of 1903; and barge traffic, 145,280 tons, compared with 151,787 tons in the same period of 1903; a total of 2,013,745 tons, as against 2,011,090 tons. For the whole of 1904 the total traffic (sea-borne and barge) was 3,917,578 tons, compared with 3,846,895 in 1903. The following is a comparison of the traffic for the eleven years during which the ship canal has been open:

Year.	Sea-borne traffic tons.	Barge traffic tons.	Total tons.
1894	686,158	239,501	925,659
1895	1,087,443	271,432	1,358,875
1896	1,509,658	316,579	1,826,237
1897	1,700,479	365,336	2,065,815
1898	2,218,005	377,580	2,595,585
1899	2,429,168	348,940	2,778,108
1900	2,784,843	275,673	3,060,516
1901	2,684,833	257,560	2,942,393
1902	3,137,348	280,711	3,418,059
1903	3,554,636	292,259	3,846,895
1904	3,618,004	299,574	3,917,578

The following were the receipts from shipping using the Suez canal in the month of January in the last three years:

	1905.	1904.	1903.
Ships .....	437	334	296
Receipts .....	11,180,000 f.	9,220,830 f.	8,318,813 f.

The result for the whole of the three past years are now to hand and are as follows:

	1904.	1903.	1902.
Number of ships.....	4,237	3,761	3,708
Gross tonnage .....	18,631,092	16,615,309	15,694,359
Net tonnage .....	13,401,835	11,907,288	11,248,413
Receipts tonnage			
in francs .....	112,062,831	101,005,580	101,067,535
Receipts passenger			
in francs .....	2,108,450	1,952,170	2,236,575
Total, including boats, domain, and all other accessory receipts in francs.....	116,870,950	104,792,434	105,389,877

In this connection and anent the agitation for a reduction

in the present Suez canal high rates, a deputation from the Liverpool Steamship Owners' association and the Chamber of Shipping of the United Kingdom has just waited upon the British foreign minister on the question of an alteration in the Suez canal agreement of 1883. The interview was private, but it is understood that the deputation advocated that the owners of all classes of steamships which make use of the canal should be adequately represented among the seven ship owning members of the London committee. The protestors against the Suez Canal company having departed from the terms of the agreement of 1883 made with the British ship owners, providing, inter alia that after a dividend of 25 per cent had been paid to the shareholders, all the net profits of the company should be applied to the reduction of the dues until such dues were reduced to 5 per cent per ton. The question will come on for discussion at the forthcoming annual meeting of the Chamber of Shipping of the United Kingdom.

Two United States post-office officials, Mr. W. S. Shallenberger, and Mr. J. M. Maslin, who recently came from New York on an official visit to London and Paris, in order to enter into arrangements to expedite the delivery of the American mail eastward, embarked at Queenstown on Thursday on the White Star liner Majestic on their return to New York. They stated that they had had interviews with the British and French postal authorities, and succeeded in arranging to have sorters on board the White Star and American liners leaving New York, so as to have the mails arranged on board and expedite their delivery on arrival at all the great centers in Great Britain and Ireland. They also stated that the Cunard company would in time fall in with the same plan, so that the mail could be sorted on the passage across the Atlantic, and ready for despatch on the arrival of the liner at the first port on the eastward passage.

### INTERLAKE YACHT REGATTA

The regatta of the Interlake Yacht association will be held from July 23 to 28, inclusive. This was decided upon at a banquet of the association held at the Hollenden, Cleveland, last week. At the banquet Commodore George H. Worthington was the presiding officer. Myron M. Voice acted as toastmaster. Commodore George T. Bliss of Erie responded to the toast "Development of the Interlake Yacht Association;" Commodore Percy W. Rice, "The Veterans;" Mr. James H. Dempsey, "Yachting from a Legal Standpoint;" Thornton Dixon, Monroe, Mich., "Monroe at a Yachting Center;" Commodore J. E. Gunkie of Detroit, "Truthful Fish Stories;" Northam Warren of Detroit, "The Younger Yachtsmen;" Commodore J. L. Dexter of Detroit, "Entertainment Experiences."

An interesting announcement was the fact that Commodore George H. Worthington is to put a gasoline motor in his famous sail yacht, the Priscilla, the largest and most beautiful yacht on the great lakes. The engine is a four-cylinder gasoline engine of 75 H. P., driving a feathering propeller wheel 42 in. diameter. The engine is designed to propel the yacht 9 miles an hour in a calm. The wheel feathers in such a manner as not to interfere in any manner when it is desired to sail the yacht. Alterations are now being made in the Priscilla at Detroit. John Craig, jr., of New York is the maker of the engine.

The British ship Silberhorn has been waiting three years for a charter in San Francisco harbor. She arrived there from Liverpool on Jan. 21, 1902, and could have got a cargo at 38s 6d. per ton but her captain wanted 40 shillings. From that day to this rates have been falling and now are 12.16 per ton. The Silberhorn is lying in Richardson's bay off Sausalito, San Francisco bay, and already has a second batch of apprentices on board.



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**FEBRUARY 23, 1905.**

The index to Volumes XXIX and XXX of the Marine Review, being the issues for the Calendar year 1904, will be ready for distribution next week and will be sent to subscribers upon request.

Out of the port of San Francisco there run five large and fast American steamers via Hawaii to the Orient. This line carries a great amount of United States mail and receives for this about \$50,000 annually. Right alongside of this American line, competing with it for freight and passengers runs a Japanese line of three steamers which receive a subsidy of \$600,000 from the Japanese government. While our merchant shipping in overseas trade has declined from 2,496,000 tons in 1861 to 888,000 tons in 1904, Japan's merchant marine has increased from 151,000 tons in 1890 to 830,000 tons in 1904.

We must either meet this universal foreign encouragement of shipping or make up our minds to quit the sea absolutely save on our own coast and have no business whatever on the ocean. In that case we shall have no need of a large navy. We shall be following the policy of China, which is almost the only nation in the world, except ours, which neglects its seamen and American ship builders—the best seamen and ship builders in the world. We shall reduce our

seaboard communities to poverty and despair. And we shall deprive ourselves of the means of defending our own coasts and harbors—for this cannot be done without a vigilant body of American seamen and an adequate seagoing fleet.

Lacking our own ships to convey at least a respectable proportion of our own goods, we shall be handicapped, as we are handicapped now, in the expansion of our commerce. Not one American steamship line runs to South America beyond Venezuela. Our trade with most of South America is absolutely at a standstill. It is less with Brazil than it was a dozen years ago. Foreign ships, which ply from our ports to South America, are controlled by foreign companies which are interested in the expansion of their own commerce. They put their old and wornout ships in this American trade and employ their new ships in the trade from their own ports. They practice monopoly and combination and discriminate in every possible way against American vessels.

A great many manufacturers, especially in the Central West, who have appeared before The Merchant Marine Commission at its recent inquiry, urged the establishment of new American lines to South America, Africa and Asia. They testified that they could make no headway in the trades of these countries, especially with South America, because the transportation by the few foreign lines that monopolize the carrying trade was irregular, unreliable and inefficient—so much so that they had often found it cheaper, quicker and safer to send their goods out via Europe. These manufacturers have not a dollar's worth of interest in shipping of any kind. They asked the commission to encourage the building of American ships, because it is only by the use of American ships that we could increase our American commerce with those distant countries.

When Great Britain needed ships for transport service in the Boer war she took them chiefly from her lines running to the United States. The result was that very soon there were not enough ships to convey our grain, provisions, cattle, tobacco, cotton and general merchandise bound to Europe. This material stacked up in the warehouses and remained unloaded in freight trains because there were no ships to take it. Our export commerce, therefore, in a few months fell off by millions of dollars, due absolutely to the fact that we had no ships of our own and that the foreign ships that ordinarily conveyed our goods were "requisitioned" by a foreign government. This treatment of our export commerce had the effect of compelling the western farmers to aid in crushing out the Boers. Great Britain, through her control of our ocean shipping, can, and probably will, make us pay a part of the cost of any war of conquest which she may enter. Her ship owners, seeing the dilemma of American farmers and that they must get their goods out of the country somehow, marked up their freight rates



thirty per cent and more, and thus we suffered from increased freight on exports, every cent of which went to Great Britain. In other words, we are now in the pitiable condition against which Thomas Jefferson warned his fellow countrymen:

"If particular nations grasp at undue shares, and more especially if they seize on the means of the United States to convert them into aliment for their own strength, and withdraw them entirely from the support of those to whom they belong, defensive and protecting measures become necessary on the part of the nation whose marine resources are thus invaded; or it will be disarmed of its defense, its productions will lie at the mercy of the nation which has possessed itself exclusively of the means of carrying them, and its politics may be influenced by those who command its commerce."

### CONTRACTS FOR TWO STEAMERS

The American Ship Building Co. has added two more orders to its already long list of contracts. It closed contract last week with the Bessemer Dock & Navigation Co. for a twin-screw car ferry steamer to come out next October. The car ferry will be a duplicate of Pere Marquette car ferries No. 19 and No. 20, except that she will have 2 ft. less beam, being 350 ft. keel, 54 ft. beam, 19½ ft. deep to the car depth and 17½ ft. to the shade deck. She will be propelled by two sets of triple-expansion engines with cylinders 19, 31 and 52 in. diameters by 36 in. stroke. Steam will be furnished by four Scotch boilers allowed 175 lbs. pressure. The new car ferry will be constructed at the Cleveland yard of the company. When completed she will be placed on the route between Conneaut and Rondeau, Port Dover and Port Stanley on the Canadian shore. The Bessemer Dock & Navigation Co. has been jointly organized by the Bessemer & Lake Erie railway (Steel Corporation road to Pittsburg) and the Canadian branch of the Pere Marquette system.

Capt. Charles L. Hutchinson, Cleveland, has closed contract with the American Ship Building Co. for a freight steamer for 1906 delivery. The placing of this order one year in advance of its actual delivery by so experienced a vessel manager as Capt. Hutchinson is especially significant. Capt. Hutchinson is following the lead set by Mr. G. A. Tomlinson of Duluth and his new steamer will be a duplicate of the two steamers building at the Bay City yard of the American Ship Building Co. for Mr. Tomlinson. The steamer will be 524 ft. over all, 504 ft. keel, 54 ft. beam and 30 ft. deep. She will have triple-expansion engines with cylinders 22½, 36 and 60 in. diameters by 42-in. stroke. Steam will be supplied by Scotch boilers, 13 ft. 9 in. diameter by 11½ ft. long, equipped with Ellis & Eaves' draft and allowed a pressure of 180 lbs. The new steamer will be built at Lorain next fall.

### DREDGE OWNERS HAVE CLOSED WITH LABOR

The Great Lakes Tug & Dredge Owners' Protective association has concluded its conference with labor. Last week contract was closed for the season with the dredge engineers and cranesmen. The chief engineer is to be paid \$130, the assistant engineer \$100 and the cranesmen \$90. Twelve hours is to constitute a day's labor. A concession was made of double time for Sundays and time and a half for overtime, should the dredges be required to work at night. Agreements were also entered into with the tug captains, firemen and linesmen upon last year's schedule. The dredge owners have the

privilege of operating the tug every third Sunday, paying double time. No Sunday labor whatever was performed last year and the owners, of course, desire to avoid it this year, if possible. The tug captain is to get \$125 per month, the engineer \$110 and the linesmen \$55, with the exception of Cleveland where \$60 is to be paid and Chicago where \$65 is to be paid.

### HONG KONG SHIPPING

Editor Marine Review:—Very few people have any adequate conception of the extent of the shipping business done in several Asiatic ports. Take Hong Kong, for example, where in the past year the tonnage entering was 7,009,181, as against 6,215,866 in the year before. Several new lines were opened, and the fleets of existing lines were increased. Great importation of coal from Australia in vessels new to the port.

Of course, as the United States is practically without an ocean-going marine, the British flag predominated. The British tonnage amounted to about half the total. The American tonnage increased, yet was only 200,706 to 3,368,788 British.

In all, 14,489 European vessels of 19,018,411 aggregate tonnage entered Hong Kong, carrying 9,708,405 tons of cargo. Our little 200,706 total tonnage for the year looks paltry beside those figures. Still, we fortunately have the port of Manila, now being extensively improved, and congress is on the eve of helping to get American ships. That we need those ships, if only to carry on our large commerce with Hong Kong, is evidenced by the following figures of that commerce for the past three fiscal years:

1902 .....	\$1,277,755	\$8,030,109
1903 .....	1,359,005	8,772,453
1904 .....	1,052,038	10,412,548

Here is an American commerce averaging over \$10,000,000 a year, with a single port, of which barely 10 per cent was carried in American ships.

What Hong Kong is to Great Britain and Europe, so eventually will Manila be to us, with the aid of American ships and the American Panama canal.

WALTER J. BALLARD.

Schenectady, N. Y., Jan. 10.

### BILLS FAVORING AMERICAN SHIPPING

Both the senate committee on commerce and the house committee on merchant marine and fisheries have authorized a favorable report on the Elkins-Littlefield bill amending a law relating to foreign wrecks so that these wrecks hereafter admitting that pursuit to the law shall be given American registry trial for the foreign and not for the coastwise service. The bill, of course, does not apply to foreign-built wrecks already acquired by Americans.

The senate committee on commerce by unanimous vote has authorized a favorable report on the bill recommended by the Merchant Marine Commission reserving to American ships the carrying of supplies, material, machinery and equipment to and from the Panama canal zone. This, if passed, will constitute one of the greatest blessings that can possibly be conferred upon the coastwise service.

Among the estimates to be voted at the present session of parliament at Ottawa, are appropriations for canals as follows: Cornwall canal, enlargement, \$7,000; Galops canal, enlargement and completion of channel, \$161,500; forming channel and building dam between Galops and Adams island, \$70,000; Welland canal, improvements, construction of elevator at Port Colborne, and improvements of Port Colborne entrance, \$987,000; Lachine canal, improvements, machinery for shops, etc., \$105,800; Rideau canal, extension, \$50,000; construction at Sault Ste. Marie, \$100,00; Trent canal, construction, \$300,000.

### FREIGHT SITUATION ON THE LAKES

It will probably be a month or more yet before any adjustment is made in lake freights. While it is admitted that the movement of ore will be heavy shippers insist that conditions do not warrant more than a 70-cent rate. Even subtracting the vessels now under construction the existing fleet is more than ample to care for a 30,000,000-ton movement and the matter must resolve itself into one of supply and demand. Moreover, conservative shippers are not sanguine that shipments will reach 30,000,000 tons, representing that while demand for iron will be brisk during the first six months of the present year no one can tell what it is going to be during the last six months, and that the Steel Corporation has the power of lessening the movement at will. In the light of this vessel owners are not inclined to discuss rates at present or to force its attention upon shippers. It will probably be, therefore, well into March before the subject of freights is seriously thought of.

The executive committee of the Lake Carriers' association is now meeting representatives of various organizations having to do with labor on the lakes and it will probably be some days yet before adjustments are actually made. As far as can be learned now no serious difficulty is anticipated in arriving at a satisfactory basis for the season's business. It is well known that operating expenses during the past two years have been higher than business conditions have warranted and some adjustment along this line is looked for. As far as the engineers are concerned, owners are entering into contract with them individually and there appears to be no point of issue except the new classification for the 10,000-ton ships. The owners of these ships feel that the new classification is a trifle unjust owing to the fact that they have so many of their small ships in the \$150 class, which was the first class last year. In equity they believe that one offsets the other. A great many of the owners have appointed their masters and the masters, who are in turn appointing mates, find no difficulty in getting the men they want. This would indicate that the new Pilots' association is not making much headway this year.

Vessel owners are quite desirous of having the differential which exists between the price of cargo and fuel coal abolished. Vessel owners are paying 10 cents per ton more to the railways for fuel coal than they are for cargo coal—and the singular thing is that the railways never know what to charge vessels for the coal until the shippers have reported how much of it was fuel and how much cargo. There was a time when this differential was probably justified by the extra labor which was required to unload the fuel coal aboard the steamer. Nowadays the same operation answers for both and the vessel owners maintain that there is absolutely no ground for the additional charge of 10 cents per ton for the coal which the vessel consumes. In this contention they have the support of the shippers and it may be that through concerted effort this differential, which appears to be no more than a survival, will be wiped out.

### IRON INDUSTRY IN NORTHWESTERN CANADA

Port Arthur, Ont., Feb. 22.—All papers have been signed and preliminaries completed for what is the first attempt in northwestern Canada to build up an iron mining and manufacturing industry. This includes the territory west of Lake Superior, and running from there to the Pacific, in distinction from the region whose westerly bounds are at the eastern end of Lake Superior. The Atikokan Iron Co., owned heretofore by the Messrs. Hunter of Duluth and A. Stanford White of Chicago, has been enlarged in capital and powers, and is to open its mines that lie north of Ely, Minn., near the line of the Canadian Northern road. It will also erect a large modern blast furnace on Lake Superior, either

at Port Arthur or Fort William, and build by-product coke ovens to furnish the fuel for smelting its ores. It will put in large and modern ore shipping piers, and one of the largest coal receiving docks on the great lakes is to go in under contract between this company, the Canadian Northern road and the Pittsburg Coal Co. The company expects to spend in these enterprises about \$2,000,000. The development, as outlined, is but a part of what is hoped for, and of what will come if the growth of the Canadian northwest increases as it promises, and the demand for iron and steel in that region is what it should be.

The company has been financed through the efforts of Mr. Jas. C. Hunter, of Duluth, and includes himself and his brother, A. Stanford White; the president, vice president, attorney and chief remaining stockholder of the Canadian Northern road, and the manager of the Crown Bank of Canada. Its stock has all been subscribed, its bonds are placed and work has begun on its developments.

The Atikokan range has been explored considerably, and on a length of 4,000 ft. where there is an outcrop rising 100 ft. above the plain, 5,000,000 tons have been proved above a depth of 500 ft. The company owns or controls about 5 miles of the formation and aside from 4,000 ft. that have been partially proven no work has been done other than to disclose the continuity of the formation. The ore is magnetic, high grade and very low in moisture, carrying a little sulphur. It is proposed to crush and roll it and roast it at the furnace by the waste gases from smelting and coke ovens. The company will not only make iron and later steel products, but it will be a shipper of ore to eastern Canada. It will have an advantage for this over any American districts on account of the dominion bonus for pig iron made from Canadian ores.

The two towns of Port Arthur and Fort William have been bitter rivals for many years, ever since the former secured the enmity of the Canadian Pacific road by levying on its locomotives for unpaid tax. The road then transferred all its operations to Fort William, built a town there and refused for years to permit its trains or ships to stop at Port Arthur. When the Canadian Northern was built, three years ago, it was received with open arms by Port Arthur, bought or was given most of the water front, has built an enormous grain elevator plant, great terminal docks, etc., and is identified with the town, while it has nothing at Fort William. Now the latter offers the Atikokan Iron Co. a large bonus in land and a subscription to its bonds, and a twenty-year tax exemption, but the influence of the Canadian Northern has prevented its acceptance, and it is likely the iron company's works will be erected at Port Arthur. The two towns join, one on the shore of Thunder Bay and the other on the Kaministiquia river, and are connected by a municipal electric railway.

The Canadian canals between Montreal and Port Arthur, according to the annual report of the departments of railways and canals, have cost the country up to the end of the fiscal year, June 30, last, the sum of \$69,245,933. The Lachine canal to Montreal took \$5,352,308, Ottawa to Kingston \$4,573,922, Lake Ontario to Georgian bay \$4,314,459, St. Johns to Sorel \$754,594, Atlantic ocean to Georgian bay \$648,547. Of the \$69,245,933 for the St. Lawrence system between Montreal and Port Arthur, the Welland canal took \$25,189,908 and the Sault Ste. Marie canal \$4,313,494. The amounts paid in cash as government subsidies in addition to land grants to Canadian railways to the end of the last fiscal year aggregated \$53,890,625, of which \$25,000,000 in cash went to the Canadian Pacific railroad. By way of the 14-ft. canal route between Montreal and Port Arthur (1,223 miles), is to Duluth 1,357 miles and to Chicago 1,286 miles. From the straits of Belle Isle to Montreal is 986 miles.



**NEW CANADIAN—FORT WILLIAM LINE**

Buffalo, Feb. 22.—The late purchase of two or three of the older package-freight liners by a syndicate represented by John J. Boland & Co. is to be the starting point of a new venture in the same business. The steamers, taken together, are the Eber Ward and J. M. Nicol of the old Ward Line and later the Union Transit Line, which was dropped when Henry C. French went out of the lake trade, and a third, the old Anchor liner Juniata, which is to be renamed the Winnipeg, for the line is to be Canadian at the other end. It is to be called the Canadian-Fort William Line and will run between Buffalo and Fort William on the north shore of Lake Superior.

There is quite an elaborate list of stopping places on the way, including Cleveland, Detroit and St. Clair river ports, in fact anywhere that there is a sufficient amount of general package freight offering. It will be impossible to stop at Canadian way ports, the tariff regulations forbidding it, so the course will be direct to Fort William from Sault river. There is a much larger amount of traffic seeking an outlet to and from the Canadian northwest of late than there ever was before and the managers of the new line are after it, having convinced themselves that there is enough to pay a profit now and that it will steadily grow.

Canada is boasting of the many people from this side of the line it is settling in the northwest country, but there is much reason for apprehension rather than complacency, for it is safe to say that every man who crosses the line is an American still, just as much as he was here and it has been nothing else but the tendency to cross over this way that has in the past kept the Canadian spirit pure and solidly against alliance with this government, pride standing up successfully against interest. It is not likely that the projectors of the new Buffalo-Fort William Line are looking for any sort of alliance between the two peoples to help their business, but they have good reason to expect a continuation of emigration to the Canadian northwest as long as there is land or anything else there that the Yankees want. Really it is the spring wheat over there that is the most coveted and Buffalo millers have this winter joined with those in the northwest in asking for a better tariff arrangement.

The masters of the new line steamers have already been appointed, as follows: Steamer Ward, A. B. Slyfield; steamer Nicol, M. S. Peterson; steamer Winnipeg, W. J. Hayes. As there is not much repair work to be done on the steamers they will be ready to begin the season as soon as the ice is out of the way. Boland & Co. will look after the line and will only need to lay out work of account on the Juniata (Winnipeg).

By the way, the prospect of an early opening of navigation has been fading away so fast of late that the lake man would be considered very hardy who would dare to predict it now. Buffalo harbor was never in a more frozen-up condition than now and but for the work of the fire tugs, there would be very little prospect of holding open any sort of a channel. Last week was probably the worst one for making ice that has come over us in a dozen years, so that the ice companies are complaining with the rest, not only that the ice is getting too thick, but that the weather is so severe that it is hard to keep the work in progress.

Capt. G. H. Vrooman, who went from here to Duluth some years ago to take charge of the tug interests there, was here last week and he reports that there is a good 2 ft. of ice in the harbor there with every prospect of there being more before there is less, as that is a locality that is never expected to see a thaw in midwinter and gets zero weather almost every day.

The cold weather makes the coal shippers rub their hands

with glee. One of the shipping agents here said last week that the question of surplus coal on the upper lake docks was already settled. The question would now be how soon could the companies get a new supply up there, for there would be none in the way of the first arrivals. But for the severe weather there would have been a lot of it loaded here now, but with the utmost effort for a month or more the steamer Umbria is the only one that has been loaded or is likely to load right away. This is the season for laying down coal here for early lake shipment, but the demand has been very close to the supply right along, so that a surplus has been out of the question.

Lumber carriers are still saying that they are looking for a smart run of business early, then a lull, with a good stir again by July or so.

JOHN CHAMBERLIN.

**LAKE WEIGHMASTERS APPEAL TO GRAIN CARRIERS**

Mr. Junius S. Smith, lake weighmaster of the Buffalo Chamber of Commerce, has sent the following circular letter to owners, managers and masters of grain carriers:

"Years ago, under the old Board of Trade, at the urgent request of the vessel interests for some action, I was appointed to the position of weighmaster (now lake weighmaster), and an attempt was made to cut down the grain shortages to a reasonable amount. A few weeks' trial convinced me that much more than mere tallying was needed. The remedy was applied as soon as proper arrangements could be made, and so far as the data I had could be brought to bear. These data have often been questioned because they were not complete, as I did not have all the work; but imperfect as they were, the result has been a reduction of fully 70 per cent in the average shortage of grain. This result has been brought about by careful, systematic work in weighing the grain, not alone at Buffalo, but at the ports from which grain is received; by the thorough test under my supervision of all scales in elevators here, and the same work on scales and connections by proper parties at the loading points; and by a constant mutual check on the work of the various elevators all over the lakes.

"These checks have in many cases indicated that some particular house was at fault, from some unknown cause, enabling us to find and correct it, often with settlement for shortage, and leaving it in good condition for other craft. Even during the past year adjustments were made covering several thousand bushels. Such adjustments, however, do not cover the whole ground, as the real saving is in keeping the houses in order for accurate work. In this our work never ceases. All this has been done at the request of the vessel interests, with a vast expenditure of time and labor, and no small cost in money, and is to the advantage of every grain carrier on the lakes. It is done without any compensation whatever to the weighmaster except as his deputies are employed by the grain carriers to see to their cargoes. It is fully appreciated by many of these, but there are still some who do not or will not understand that all this work should go through this one channel in order to be just to themselves and to me."

The senate committee on commerce last week authorized Senator Gallinger to report favorably a substitute for the Merchant Marine Commission's bill, requiring that only vessels of the United States shall be employed in the transportation by sea of materials and equipment to be used in the construction of the Panama canal, and the operation of the Panama railroad. The bill also provides that only vessels of the United States shall be used in carrying naval supplies between the United States and the naval station at Guantanamo, Cuba.

## ITEMS OF GENERAL INTEREST

The house committee on industrial arts and exposition has reported favorably upon a bill to uphold an international naval marine and military exposition at Jamestown, Va., in 1907.

It is stated that the Thames Ferry Co., New London, Conn., is to build a new ferry boat for the Groten and New London ferry. The plans call for a boat 140 ft. long, 50 ft. beam and 9½ ft. deep. She will virtually be a paddle-wheel steamer.

Cable advices from Paris indicate that the French cruiser Sully which struck a rock in Allouez bay northeast of the Red river, Delta, Tonquin, on Feb. 8, is a total wreck. The Sully is of 9,856 tons displacement and was built at La Sayne in 1901.

The Ocean Steamship Co., plying between New York and Savannah and Boston and Savannah, and comprising eleven ships in its fleet, is installing wireless telegraphy on all its vessels. This service will be in operation within the next week or ten days.

A tank full of gasoline exploded on board the British submarine torpedo boat A-5 at the testing grounds, Queenstown, Ireland, last week. Three men were killed and fifteen injured. A court will be summoned at once to place the responsibility of the accident.

The big freight steamer Hazel Dollar, built on the Clyde for the Dollar Steamship Co. of San Francisco, was launched on Jan. 25. Capt. Gow, formerly commander of the steamer M. S. Dollar, which ran on the rocks near Vladivostok, will bring the Hazel Dollar from Glasgow to San Francisco when she is completed.

A strong effort was made by Puget Sound ship owners to induce the senate to abolish army transport service between San Francisco and the Philippines, sell the vessels and let private lines compete for the business of the national government. The United States senate has decided, however, to support the transport service for another year.

An ingenious Frenchman, M. Heit, has designed a recording compass. The Bulletin de la Soci  t   Industrielle de Marseilles has some account of the invention and it is claimed to be capable of registering automatically, minute by minute, the course taken by the vessel. The chart so made can be used to determine the route followed at any given period of the passage.

The wrecking steamer Premier has returned to Kingston, Jamaica, from Gonaives, Hayti, where she went to examine the hull of the Firminist gunboat Crate A. Pierrot which was sunk by the German cruiser Pantha in September, 1902. The examination of the sunken steamer was made with a view to raising her, but it was concluded that the cost would be too great.

The steamer Geo. W. Elder, which ran on a rock in the Columbia river last month (January), has been abandoned to the underwriters. The cargo was taken from the wreck and conveyed to Portland, Oregon. The Pacific Mail Steamship Co. will put the steamer Costa Rica on the run between San Francisco and Portland, with Capt. C. Randall of the G. W. Elder in command.

Quite a campaign is now being waged against the tolls charged on the Suez canal. Fairplay contains a list of ninety-one steamers of a total of 240,227 net registered tons which used the Cape route in preference to the Suez canal in order to avoid the tolls. This meant a loss of more than half a million dollars to the canal company in tolls. Added to this is the fact that some of the largest liners cannot use the canal owing to their heavy draught and Fairplay thinks the canal company manifests the utmost complacency in the face of a serious situation.

The large launch William D., owned by Henry Peterson of San Francisco, has just been equipped with a new engine. The

old engine weighed 5,800 lbs. and the flywheel 1,200 lbs., the engine developing 27 H. P. The new engine weighs 2,600 lbs. and the flywheel 200 lbs., the engine developing 50 H. P. The engine is a four-cylinder one, on the four-cycle principle, is operated without a battery and is equipped with noiseless reversing gear. It was built by Frank Peters, who is Henry Peterson's chief engineer. A patent on the noiseless reversing gear has been applied for.

The new steamer which will be built by Harlan & Hollingsworth Co., Wilmington, Del., for the old Day Line to ply between Norfolk and Baltimore will be a duplicate of the Alabama. The new steamer will be 306 ft. long over all, 44 ft. molded beam, 55 ft. beam over guards and 18½ ft. deep. She will be equipped with triple-expansion engines with cylinders 24½, 40 and 47 in. diameters by 42 in. stroke. Steam will be supplied by four Scotch return tubular boilers fitted with three corrugated furnaces. Her cost will be approximately \$400,000 and in appointments the steamer will be modern in all respects.

The contract for furnishing boilers for the armored cruisers Montana and North Carolina, which are to be constructed at Newport News, has been let to the Babcock & Wilcox Co., which has installed boilers in all the warships built at the Newport News yard in the past five years excepting the battleships Missouri and Virginia. This contract amounts to about \$500,000, as the boilers for each ship will cost about \$250,000. The keels for the Montana and North Carolina will be laid in about sixty days. The vessels are to be completed within thirty-six months from the date of the contract, and for each the ship building company is to receive \$3,575,000.

The auxiliary yawl Yonondio has been sold by Chas. Morgan, N. Y. A. C., to Mr. A. A. Spadone of New York, through the office of Stanley M. Seaman, New York. She is 46 ft. over all, 31 ft. water line, 14 ft. beam, 4 ft. draught; designed by Chas. G. Davis and built in 1899 by Detroit boat works for C. J. Bousfield, Bay City, Mich. Mr. Bousfield sold her through the above agency to Mr. Morgan in 1901 at which time she was brought east via the great lakes and canals by Capt. John T. Corwin in a successful voyage lasting five weeks—very fast time for a boat of her length. Mr. Spadone will have her fitted out early in the spring for use in South bay and Long Island sound.

The steamer George W. Elder, which has been traveling for nearly thirty years between San Francisco and northern ports, has met with disaster at last. On Sunday, Jan. 22, on her way from Portland to San Francisco she struck a rock in the Columbia river near Goble, about forty miles from Portland. A hole was stove in her port side a short distance forward of amidships and she sank in 15 ft. of water. Her rudder fouled a snag and the vessel left the channel. The river steamer Assaio took the G. W. Elder's passengers back to Portland. After she has been unloaded, the disabled vessel will be dry-docked at Portland. The Elder was built by John Roach, Chester, Pa., in 1874.

What is practically a new import trade has been brought to the Mersey through the operation of the Brussels sugar convention and the prevailing high prices of British refined sugar. The White Star steamer Georgia, which has arrived in Liverpool just recently from New York, brought among her cargo a consignment of 1,000 barrels (about 160 tons) of refined sugar. This is the first importation of refined sugar into Liverpool for perhaps fifteen or twenty years, and has only become possible by the high rates of the home product. It is evident that unless the home prices come down the American refiners will compete keenly in the British market to the no small advantage of the shipping lines in the Atlantic trade, to whom the freight will be very welcome.

Representative Butler of Pennsylvania had an audience with President Roosevelt this week. It was reported that



Representative Butler was opposed to granting the large appropriation for increasing the navy recommended by the navy department and the president accordingly sent for him. Mr. Butler assured the president that he was not opposed to a proper increase in the navy but was opposed to a constant increase incidental to the administration of the department. The president informed Mr. Butler that he believed the policy of adding ships to the navy should be continued, and expressed the hope that congress would adhere to that policy. The navy department has recommended that \$45,000,000 be appropriated the coming year for the increase of the navy.

Preliminary steps looking to the establishment of a steel ship building industry at Halifax have been taken. The Shipbuilding & Investment company has been organized and has secured a favorable site on the water front at that point, fifty acres of land being available. The directors who have been selected are Mr. Hunter of Swan & Hunter, shipbuilders at Newcastle-on-Tyne; George S. Campbell, George Stairs, John Longford, B. F. Pearson and Ald. J. A. Johnston of Halifax. George S. Campbell will be president of the company, which has been incorporated under the new joint stock company act of Nova Scotia. The new company will endeavor to secure the building of lake steamers for Canadian firms, the contracts for which in the past have gone to English ship builders.

Secretary Morton of the navy department has seen fit to publish a statement to the effect that the bid of the Midvale Steel Co. for 8,000 tons of armor plate for the battleship New Hampshire and armored cruisers North Carolina and Montana was not rejected because the Midvale company had sublet a part of its previous armor plate contract to the Carnegie and Bethlehem Steel companies. On the contrary he appreciated the motive which led the Midvale company to divide its contract and commended it for doing so. While the bid of the Midvale company for supplying 8,000 tons of armor for these last war vessels was the lowest the secretary concluded it to be wise to give the work to the Carnegie and Bethlehem Steel companies, because the Midvale company has not as yet begun the regular product of armor in quantity. Until it had the opportunity to deliver plates for trial in suitable quantities the bureau of ordnance did not feel warranted in giving it further orders.

The steam yacht Privateer, owned by R. C. A. Smith of New York, who has recently been elected vice commodore of the Larchmont Yacht club, is undergoing extensive alterations at the yards of the James Reilly Repair & Supply Co., Jersey City. When the alterations are completed Commodore Smith will have a vessel unique in many ways. There will be nine staterooms and saloon aft, communicating by enclosed passage, with large dining saloon forward on main deck, in addition to which there will be another deck saloon forward in the mahogany house on upper deck. With the new arrangement Privateer will have a complete promenade deck from stem to stern, and as all the rooms are unusually large, well laid out, ventilated and lighted, she will be most attractive. Her high speed and excellent seagoing qualities have been noted during the past two seasons, when she has been constantly in use by Mr. Smith and his guests. The work is in charge of Messrs. Gardner & Cox, her designers, and will be finished May 16.

The subject of electric towing on the Erie canal is now being considered by a committee of the board of commissioners appointed to investigate and report upon this subject to the New York legislature. The board included a joint committee of the senate and assembly, the state engineer and surveyor, the superintendent of public works and five engineers appointed by the governor. A sub-committee met recently to receive and examine detailed plans and specifications

offered by various persons for electric towing. Ex-Representative John Murray Mitchell, No. 25 Broad street, attended as a representative of the International Towing & Power Co. He introduced Percy Thompson, the president of the company, and read a letter from Wm. Barclay Parsons commending the system of the International company. Richard Lamb, an engineer of 136 Liberty street, was also present. He is the inventor of a system of electric traction. He has a patent for an electrical conduit on the surface of the tow path and another for an elevated wire or conduit.

On Thursday last a conference of much importance in regard to the North Atlantic rate war was held in Liverpool. The meeting, which was of a private nature, was attended by Capt. Moller of Copenhagen, Mr. Acheson of the Anchor Line, and well-known chief representatives of shipping interests in Liverpool. The principal matter of discussion was the Scandinavian passenger business, and this, it is understood, was finally adjusted to the satisfaction of all parties. Capt. Moller when he left Liverpool seemed perfectly satisfied with the arrangements made, and it is believed that, so far as this section of the long-standing dispute is concerned, all has been satisfactorily arranged. The status now is such that the war may be regarded as practically at an end, though the Cunard and White Star Lines may have some administrative matters to settle between themselves. It may be added that the chief points in dispute with regard to the third-class rates to be charged on the various classes of steamers have been more or less settled, and the remaining difficulties have been narrowed down to a small margin.

A report made recently by the British Board of Trade on the naval expenditures of the leading powers for the latest available year presents interesting figures. The report deals with the year ending March 31, 1903. From the exhibit it appears that the United Kingdom spends more on its navy than Russia, Germany and France spend on their combined fleets. The British naval expenditure is more than double that of the United States. Russia's naval expenditure for the year named was five times as large as that of Japan. Russia spent less than 6 per cent of her revenues on her navy. Japan spent 9 per cent of her revenues in this way. The country which now spends most on its navy next to Great Britain is the United States. The British mercantile marine exceeds in tonnage that of Russia, Germany, France, Italy, the United States and Japan put together. The mercantile marine tonnage of Great Britain reaches 10,268,604 tons; that of the United States 888,776, registered for over-sea trade. Russia's tonnage is 678,504. The position of the United States is next above that of Russia and below that of Japan, with 979,423 tons. Germany's mercantile marine tonnage is 2,203,804.

#### OBITUARY

Capt. James A. May died at his home at Windsor, Ont., last week. He was for fifty years in the employ of the Grand Trunk Railway ferry service, for the past fifteen years being in command of the car ferry transfer Lansdowne.

Capt. Daniel Mabce died at Milwaukee last week. He had followed the lakes since boyhood. He was born in Fleming, N. Y., Jan. 6, 1829, and had lived in Milwaukee for nearly fifty years. The last steamer he commanded was the George Brown.

Capt. Theodore Lane, one of the oldest and best known vessel men on the great lakes, died at his home in Racine, Wis., last week. He went to Racine in 1836 and began sailing when he was fourteen years old. In 1855 he took command of the schooner Pacific in the grain trade between Chicago and Buffalo. He served two years during the civil war and then returned to the lakes.

### APPOINTMENTS OF MASTERS AND ENGINEERS

Mitchell & Co., Cleveland: Steamers—Stephen M. Clement, Capt. C. B. Galton, Engineer Wm. Fetting; Frank H. Good-year, Capt. H. A. Stewart, Engineer Wm. Fritz; Moses Taylor, Capt. Fred D. Galton, Engineer I. A. Francombe; Wm. H. Gratwick, Capt. R. C. Jackson, Engineer C. J. Love; James Gayley, Capt. H. H. Townsend, Engineer John Maedel; Walter Scranton, Capt. M. M. Stewart, Engineer Henry Graves; John J. Albright, Capt. J. W. Auttersson, Engineer Peter Lavelly; Wm. E. Reis, Capt. John D. Baird, Engineer Louis Minnie; M. A. Hanna, Capt. Alex. Beggs, Engineer John Riley; H. C. Frick, Capt. J. B. Lowe, Engineer F. B. Parker; Henderick S. Holden, Capt. G. E. Anderson, Engineer John Scott; Lagonda, Capt. Ed. Johnston, Engineer Wm. L. Lang; Major, Capt. F. R. Hemenger, Engineer Otto Guy; J. J. McWilliams, Capt. Fred Furtam, Engineer Gus. Guy; Robert L. Fryer, Capt. J. G. Sauer, Engineer Frank Thomas. Schooner—Troy, Capt. Henry Deim.

Tonawanda Iron & Steel Co., Tonawanda, N. Y.: Steamers—Fleetwood, Capt. G. W. Honner, Engineer Harvey Dupuy; John F. Eddy, Capt. John R. Hesson, Engineer W. J. Cunningham; Oceanica, Capt. Thomas L. Van Dusen, Engineer Rudolph Shinsky; George Spencer, Capt. Frank Coulin, Engineer H. D. Fifield; Clyde, Capt. Burt Ward, Engineer E. H. Parry; Veronica, Capt. John L. McIntosh, Engineer Abraham Wood; C. F. Curtis, Capt. F. S. Forton, Engineer James Walsh; Fred Mercur, Capt. J. T. Kenney, Engineer J. A. Westrick; H. E. Packer, Capt. George H. Lane, Engineer Fred Hebard. Schooners—B. L. Pennington, Capt. C. C. Hanley; Moravia, Capt. Peter Kaischgens; Amboy, Capt. Joseph A. Thodey; N. C. Holland, Capt. J. H. Christie; T. S. Fassett, Capt. John Bourklund.

Detroit & Cleveland Navigation Co., Detroit: Steamers—City of Detroit, Capt. Alex. K. McKay, Engineer Wm. Huff; City of Cleveland, Capt. Archibald McLachlan, Engineer John Hall; City of Alpena, Capt. Matthew Lightbody, Engineer A. Phillips; City of Mackinac, Capt. Fred Simpson, Engineer Wm. McDonald; State of Ohio, Capt. A. H. McLachlan; City of the Straits, Capt. S. O. Robinson.

Rhodes, R. R., Cleveland: Steamers—Yale, Capt. James Jackson, Engineer Harry Stone; Wm. Castle Rhodes, Capt. P. Doudell, Engineer Guy Hemenger; Minneapolis, Capt. Walter Robinson, Engineer D. J. McMillan; St. Paul, Capt. Peter Thompson, Engineer Henry Stone; Huron, Capt. Neil Anderson, Engineer Clinton Folkerts.

McKay, R. O. & A. B., Hamilton, Ont.: Steamers—Strathcona, Capt. John Irving, Engineer Wm. Harman; Donnacona, Capt. J. W. Mawdesley, Engineer John S. Duguid; Neepawah, Capt. Oliver Patenaude, Engineer James Smeaton; Wahcondah, Capt. Harry Zealand, Engineer John Waller; Lake Michigan, Capt. J. H. Fitzgerald.

Waldo, L. C., mngr., Northwestern Trans. Co., Detroit: Steamers—Harvey H. Brown, Capt. D. Girardin, Engineer Nicklas Anderson; Fayette Brown, Capt. D. Girardin, jr., Engineer Robert Cummings; S. R. Kirby, Capt. Thomas H. Sanders, Engineer Charles E. Collins; Schooner—George E. Hartnell, Capt. C. L. Allen.

Eddy-Shaw Transit Co., Bay City, Mich.: Steamers—City of Bangor, Capt. A. J. Mahon, Engineer John Conroy; Penobscot, Capt. Wm. A. William, Engineer E. A. Hoffman; Selwyn Eddy, Capt. G. D. Tullian, Engineer W. P. Hoffman; E. C. Pope, Capt. L. H. Powell, Engineer W. Anderson.

Elphicke & Co., C. W., Chicago: Steamers—W. L. Brown, Capt. W. B. McDonald, Engineer W. H. Walker; Mary C. Elphicke, Capt. Joseph Matthews, Engineer S. C. Davis; G. Watson French, Capt. John Massey, Engineer D. W. Rice; Phenix, Capt. E. C. Vanpatten, Engineer Wm. Frazer.

Stevenson, John, Detroit: Steamers—Miami, Capt. H. Huyser, Engineer John Elsey; W. P. Thew, Capt. Wm. J. Jock, Engineer J. Shancroft; Hattie, Capt. George King; Schooner—A. Gebheart, Capt. Ed. Biddlecomb.

Dunham, R. J., Chicago: Steamers—Ravenscraig, Capt. Wm. Anderson, Engineer E. B. Purvis; City of London, Capt. Arnold Green, Engineer J. R. Bennett; Black Rock, Capt. J. F. Hansen, Engineer Frank Reilly.

Lake Transit Co., Buffalo: Steamers—Lackawanna, Capt. C. J. Graser, Engineer W. B. Lewis; Scranton, Capt. H. W. Stewart, Engineer Frank D. Frederick; Russia, Capt. Alex McGowen, Engineer Wm. Brown.

Hart Steamboat Line, Green Bay, Wis.: Steamers—Fannie C. Hart, Capt. Joe Carrigan; Eugene C. Hart, Capt. Charles Graves, Engineer C. Dennis; Harriet A. Hart, Capt. C. B. Hart, Engineer Ed. Donahue.

Detroit & Buffalo Steamboat Co., Detroit: Steamers—Eastern States, Capt. Duncan McLachlan, Engineer J. P. Wells; Western States, Capt. Frank G. Stewart, Engineer A. Carter.

Havey, Hugh R., (C. W. Kotcher, owner), Detroit: Steamers—Saginaw, Capt. A. Kotcher, Engineer A. Hayward; J. H. Pauly, Capt. A. H. Shafer; Barge—Kelley, Capt. A. H. Frosny.

Cleveland & Buffalo Trans. Co., Cleveland: Steamers—City of Erie, Capt. H. McAlpine, Engineer J. Y. Rendall; City of Buffalo, Capt. W. H. Smith, Engineer Chas. Lorimer.

Barry Bros. Trans. Co., Chicago: Steamers—City of Fremont, Capt. Thomas Barry, Engineer Charles Grobbs; F. & P. M. No. 1, Capt. Joseph Lamoreaux, Engineer James Reid.

Shilling, Warren, C., Green Bay, Wis.: Steamers—City of Green Bay, Capt. P. S. Raulett, Engineer Joseph Prevot; Two Myrtles, Capt. John Johnson, Engineer Andrew Johnson.

Northern Steamship Co., Buffalo, N. Y.: Steamers—North Land, Capt. J. J. Hartman, Engineer M. N. McDonald; North West, Capt. George A. Minar, Engineer A. T. Stewart.

Homegardner, John, jr., Sandusky: Steamers—Mary H., Capt. Hugo Steiert, Engineer George Moore; City of Rossford, Capt. John Steible, Engineer Wm. F. Mayer.

Grace Harbor Lumber Co., Detroit: Steamer—Tempest No. 2, Capt. Wm. P. Quinlan, Engineer Robert Craig; Schooner—C. G. King, Capt. James Hamilton.

Osborne, F. M., Cleveland: Steamers—John W. Moore, Capt. E. Detlefs, Engineer A. G. Bohland; Louisiana, Capt. J. L. Bradshaw, Engineer Harry Edmondson.

Mitchell & Rowland Lumber Co., Toledo: Steamer—Sachem, Capt. H. R. Moore, Engineer James Leitch; Barge—George B. Owen, Capt. Nels Johnson.

McBrier, James, Erie: Steamers—Sevana, Capt. D. S. McDonald, Engineer Wm. Phillips; Nyanza, Capt. C. H. Wilson, jr., Engineer J. I. Blanchette.

Becker, W. H., mngr., The Robbins Transportation Co., Cleveland: Steamer—Francis L. Robbins, Capt. H. G. Haybarger, Engineer Frank J. Randall.

McCarthy, Jerry, Buffalo: Schooners—Iron City, Capt. John Bartley; Grace Holland, Capt. M. Nagle; G. H. Warrington, Capt. F. Desott.

Carter, E. D., Erie, Pa.: Steamers—Panay, Capt. C. H. Wilson, Engineer M. J. Kelley; Luzon, Capt. A. E. White, Engineer John J. Stevens.

Groh, Oley, Sheboygan, Wis.: Tug—Satisfaction, Capt. Wm. Groh, Engineer Joshua Ritchie; Schooner—Quickstep, Capt. Wm. Lorenz.

Becker, W. H., mngr., Columbia Steamship Co., Cleveland: Steamer—Francis Wildar, Capt. Henry W. Stone, Engineer J. F. Walsh.

Indiana Transportation Co., Michigan City, Ind.: Steamer—



Indianapolis, Capt. Donald MacLean, Engineer Charles Warwick.

Myles Transportation Co., Ltd., Niagara Falls, N. Y.: Steamer—Myles, Capt. J. S. Moore, Engineer Peter Ryan.

Waldo, L. C. mngr., Roby Trans. Co., Detroit: Steamer—L. C. Waldo, Capt. John Duddleson, Engineer N. E. Allen.

Conlon, J. & T., Thorold, Ont.: Steamer—Erin, Capt. P. Sullivan; Schooner—F. L. Danforth, Capt. B. McIntyre.

Becker, Wm. mngr., Lakeland Trans. Co., Cleveland: Schooner—George W. Roby, Capt. George Mackie.

Bigelow Bros. & Walker Co., Chicago: Steamer—Madagascar, Capt. Dorin Elliott, Engineer Charles Nerritur.

Owen Trans. Co., J. Emery, Detroit: Steamer—John Owen, Capt. H. F. Archer, Engineer S. L. Phillips.

Shacklett, J. M., Marine City, Mich.: Steamer—Faustin, Capt. P. L. Williamson, Engineer Arthur Dwight.

Manitou Steamship Co., Chicago: Steamer—Manitou, Capt. Allan McIntyre, Engineer B. T. McCanna.

Fairgrieve & Co., J. B., Hamilton, Ont.: Steamer—Arabian, Capt. J. V. Trowell, Engineer W. H. Cunningham.

Wisconsin Transportation Co., Sheboygan, Wis.: Steamer—Brazil, Capt. R. Riebolt, Engineer A. J. Wilson.

Calumet Transit Co., Milwaukee: Steamer—R. M. Peck, Capt. A. C. Callam, Engineer Wm. Bridges.

Koch, C. McG., Sandusky: Steamer—Annie Laura, Capt. D. O. Lockhart, Engineer Jerry Shampaign.

Blodget, W. C., Oswego, N. Y.: Steamer—St. Joseph, Capt. F. J. Eber, Engineer James McNally.

Alger, Smith & Co., Detroit: Steamer—Gettysburg, Capt. Wm. Jagenow, Engineer Wm. P. Wenner.

Brown Steamship Co., Cleveland: Steamer—Castalia, Capt. John F. Jones, Engineer Edward Dempsey.

Sanborn, Wm., Alpena, Mich.: Steamer—Alaska, Capt. Charles Marscero, Engineer John Dashow.

Meyer, W. H., Milwaukee, Wis.: Steamer—Christopher, Capt. W. E. Wright, Engineer Scott Pratt.

Loutit, W. H., Grand Haven: Steamer—Pentland, Capt. Thomas McCambridge, Engineer C. Ball.

Ball, J. E., Buffalo: Steamer—P. P. Miller, Capt. F. Weinheimer, Engineer W. C. McDougall.

S-W. Co., Cleveland: Steamer—A. G. Lindsay, Capt. C. H. Woodford, Engineer John Duchene.

McMillan, M. B., Detroit, Mich.: Steamer—Admiral, Capt. John H. Ivers, Engineer P. B. McCabe.

Wanwig, A. C., Chicago: Steamer—J. D. Marshall, Capt. A. C. Wanwig, Engineer Christ Dahl.

Hall, Capt. J. B., Buffalo: Steamer—New Orleans, Capt. J. H. Coleman, Engineer P. F. Conmiff.

Engelking, George, Chicago: Steamer—T. S. Christie, Capt. P. Larsen, Engineer U. J. Merrill.

Ashley & Dustin, Detroit: Steamer—Frank E. Kirby, Capt. A. J. Fox, Engineer Julius Holder.

Miller, J. C., Marine City, Mich.: Steamer—Rand, Capt. J. C. Miller, Engineer John Stevens.

Harlow, W. H., Toledo: Steamer—Harlow, Capt. Wm. J. Harlow, Engineer M. McNamara.

Green, John, Buffalo: Steamer—Lewiston, Capt. Samuel Thurston, Engineer James Green.

White, Guy, N. Tonawanda, N. Y.: Steamer—Edward Smith, Capt. Chas. D. Miller.

Dreiske & Co., Louis, F., Chicago: Schooner—Ralph Campbell, Capt. Peter Hansen.

Pederson, Knud, Tonawanda, N. Y.: Schooner—Commodore, Capt. K. Pederson.

Kroos, Julius, Sheboygan, Wis.: Steamer—Susie Chipman, Capt. N. A. Gunderson.

Corning, Gurdon, Saginaw, Mich.: Schooner—Our Son, Capt. George W. Ryan.

Balfour, J. M., Marine City, Mich.: Schooner—Uranus, Capt. J. M. Balfour.

Carrington, E. T., Bay City, Mich.: Schooner—Allegheny, Capt. W. H. Bridges.

Jackson, George D., Bay City: Schooner—G. K. Jackson, Capt. Curtis Jackson.

Chandler, H. & J., Detroit: Schooner—Senator, Capt. Charles Anderson.

Sandusky Lumber Co., Sandusky: Steamer—Linden, Capt. J. H. Warwick.

Kohn, Ben C., Bay City: Schooner—Harvey Bissell, Capt. H. A. Pierce.

### WINDSOR, ITS ADVANTAGES AND INDUSTRIES

Roland J. Hemmick, consul at Windsor, Ont., contributes to the state department a rather interesting article on the town of Windsor with which everyone who sails the great lakes is familiar. He says:

Windsor is the only city in the county of Essex, and as the towns of Walkerville and Sandwich border upon the limits of Windsor, it is but just to consider all three as one municipality. The same streets and roads and an electric car line connect the three places, and although they are governed by distinct bodies and collect their own taxes, their citizens have so many interests in common that they are looked upon by many as one city with a population of 20,000. Windsor has one of the best locations in the Dominion of Canada, but, on account of its distance from other cities, the manufacturers are handicapped by extra freight rates. This has proved a great drawback in enlisting capital to establish manufacturing industries here, but owing to the recent action of the government the railways will be compelled to modify their rates.

At the recent session of the dominion parliament, legislation was enacted which was designed to compel American manufacturers doing business with the dominion to manufacture their goods in Canada, and Windsor is the logical location for many of these industries. The town is well adapted for manufacturers, so far as shipping facilities are concerned. The Detroit river is the open door to the waterways of the east and west, and during the summer months boats from every Canadian port call at Windsor for freight. Windsor has many attractions for residents, although there is always a shortage of dwelling houses. One great inducement for residents is the low cost of living. The city has a public (Carnegie) library, six public schools, seven churches of different denominations, a great number of excursion boats on the Detroit river in summer, fifty trains daily, requiring eight car ferries to transfer freight and passengers, three newspapers, a hospital, a young ladies' academy, eight hotels, the finest mile race track in America, natural mineral wells, a splendid market, five banks, a savings and loan company, and not a vacant house at the present time.

The consular district of Windsor embraces one-half of the county of Essex; the consulate of Amherstburg comprises the other half of the county. The district is purely agricultural, and as the land is level it is adapted to all kinds of farming. Windsor has the advantage of four railway lines with terminals here, and these lines tap every district in Canada, besides all the chief arteries of the United States. The railroads are the Grand Trunk, Wabash, Michigan Central and Canadian Pacific. The town is within five minutes' ride of the city of Detroit.

The imports from the United States entered for consumption in the district for the fiscal year ended June 30, 1904, amounted to \$3,780,800, an increase of \$626,177 on the imports of 1903. Every year shows a gradual increase in these imports. Iron pipe, tubing, rails, and other manufactures of iron and steel, coal, cotton fabrics, drugs, and coal oil are the principal articles of import from the United States; woollens

are about the only articles of import from Europe; the only agricultural implements imported are plows from the United States.

The exports to the United States from Windsor during the year ended June 30, 1904, amounted to \$1,231,130, an increase of \$168,575 on the exports of 1903. One of the largest distilleries in Canada is located at Walkerville, two miles from Windsor, and whisky valued at \$362,000 was shipped from this district to the United States during the last fiscal year. This export is increasing every year. Lumber is the next principal export from Windsor to the United States. Natural gas, of which \$78,000 worth was exported to the United States in 1903, has been entirely exhausted and the pipes taken up. The exportation of staves at present is hardly worth mentioning, whereas for fifteen or twenty years it was a thriving industry.

### AROUND THE GREAT LAKES

The name of the old package freighter Delaware will be changed to Charles J. Hill.

The joint conference between the Dock Managers' association and the employes on the docks will be held at Cleveland, March 27.

The Merchants' Montreal Line has purchased the China of the Anchor Line and will place her on the Cleveland-Montreal route the coming season.

A revision in colors of the chart of Ontonagon harbor, Lake Michigan, has just been issued by the United States lake survey office and is for sale by the Marine Review.

Mr. E. L. Hedstrom has let a contract for the building of a coal trestle on the Blackwell canal near the foot of Michigan street, Buffalo. The trestle will have a capacity of from fifteen to eighteen cars.

The house committee on interstate and foreign commerce has authorized a favorable report upon the bill to appropriate \$125,000 for the construction of a lighthouse at Rock of Ages, Lake Superior.

The work of pulling the steamer Victory apart to insert a 72-ft. section amidship was accomplished in twenty-eight minutes at the Superior yard of the American Ship Building Co. last week.

Major W. L. Seibert of Pittsburg, Major J. G. Warren of Milwaukee, and Gen. O. H. Ernst of Chicago, members of the special commission appointed to inquire into the necessity of an emergency lock at the Sault, met in Detroit this week.

Capt. Neil Campbell who was in the Steel Corporation steamer Maunaloa last year will bring out the great steamer Henry C. Frick, building at the West Bay City yard of the American Ship Building Co. for the Pittsburg Steamship Co.

Abram Smith & Son, Algonac, Mich., have issued this year a very novel calendar. It is a photograph from life of three colored men playing poker representing one of them passing an ace by means of his nether extremities. The calendar is entitled "The Skin Game" and is most appropriately named.

With the assurance of the city of Chicago that the tunnels at La Salle and Washington streets will be removed by April 1 of next year the Chicago River Improvement association will send a committee to Washington to urge the incorporation in the river and harbor bill for an appropriation of \$1,000,000 for dredging Chicago river.

The new freight steamer building at the Cleveland yard of the American Ship Building Co. for Capt. Charles L. Hutchinson of Cleveland will be named Wm. A. Paine in honor of the president of the Copper Range railway. Mr. Paine is a resident of Boston. When the new steamer comes out she will be commanded by Capt. Wm. P. Benham.

At the annual meeting of the stockholders of the Great Lakes Towing Co. held at Jersey City, N. J., last week the

following directors were elected: George H. Garretson, Harry Coullby, L. M. Bowers, L. C. Hanna, H. G. Dalton, C. W. Elphicke, James Ash, R. R. Rhodes, C. E. Grover, James Davidson, A. B. Wolvin, Edward Smith, D. Sullivan, T. F. Newman and John A. McGean.

The steamer Penobscot of the Eddy-Shaw Transit Co. which has occupied the stationary dock of the south ship yard of the Milwaukee Dry Dock Co. for over a month, has been converted from a package freighter into a coarse freighter, 'tween deck having been removed. The Penobscot ran on Racine reef last September and twenty-nine of her plates had to be taken off and rerolled.

The growing importance of Fort William and Port Arthur as the shipping points for the grain of the Canadian northwest is shown in the latest addition of the elevator facilities of the twin ports. The new structure which has just been completed by the McDonald Engineering Co. of Detroit has a capacity of 500,000 bu. and is constructed of steel. It is of the cylindrical type and is equipped with the most modern labor saving machinery. The elevator is owned by the Ogilvie Flour Milling Co.

The advisory board of the Marine Engineers' Beneficial association held an informal conference with the Lumber Carriers' association at Detroit last week, but failed to reach an agreement on the subject of wages. The engineers presented a scale of wages slightly in excess of the schedule of last year. The lumber carriers declined to consider it and presented instead a schedule offering a reduction of about 5 per cent from last year's scale. This the engineers refused to accept and the conference was declared off.

With few exceptions all the vessels chartered to load coal cargoes at Milwaukee during the winter have been unloaded. Coal is moving freely into the interior towns and indications are that the stock at Milwaukee will be pretty well cleaned up by the opening of navigation. Mr. A. E. Uhrig, president of the Milwaukee Western Co., says that at the close of navigation last year there were approximately 2,200,000 tons of hard and soft coal on the docks at Milwaukee. When stock was taken Jan. 1 last, something over 1,000,000 tons remained.

The car ferries of Lake Michigan are having their customary struggle with ice and during the past week five of them became stalled. Pere Marquette No. 20 was held fast in ice 5 miles from Ludington, Pere Marquette No. 4 was stalled off Little Point Sauble, car ferry Grand Haven became fastened in the ice off Grand Haven as did also the steamers Naomi and Nyack. Reports from the east shore indicated that the entire shore was lined with from 5 to 20 miles of ice which had been packed against the beach by heavy west winds. Some of the passengers who were weary of their forced imprisonment, left the steamers and made their way to shore.

The pressure of ice carried away 100 ft. of the upper dam of the West Neebish improvement, St. Mary's river, last week. The West Neebish improvement is the first channel deepening job on the lakes which is being cut in the dry. St. Mary's river, to the westward of Neebish island, was dammed above the work and an intermediate and lower dam was constructed. The water was then pumped out and the stone quarried instead of dredged, as is the common procedure in this class of work. None of the machinery used in the excavation was destroyed beyond repair, the big loss to the contractors on account of the flooding of their work being in loss of time and expense of pumping out the several acres now under improvement.

Bids for dredging out Bar Point shoals were opened last week by Col. Charles E. L. B. Davis, United States engineer at Detroit. The work to be done is to provide a clear depth

of 21 ft. for a minimum width of 400 ft. and for a possible maximum width of 800 ft. through Bar Point shoal through deep water in Lake Erie. Breymann & Bros. of Toledo were the lowest bidders, their bid being 27 cents per cubic yard or a total of \$324,000. The totals of other bids were as follows: Chicago & Great Lakes Dredge & Dock Co., \$342,000; Detroit Dredging Co., \$348,000; M. Sullivan, Detroit, \$348,000; L. P. & J. A. Smith, Cleveland, \$360,000; Lake Superior Contracting & Dredging Co., \$372,000; Samuel O. Dixon, Milwaukee, \$370,000; Buffalo Dredging Co., Buffalo, \$396,000.

Alfred McNevin of Detroit, teacher of navigation and compass adjustment, had a conference with the board of supervising inspectors in Washington last week in which he urged that examinations should be extended to include the details of compass management. He maintained that officers at present have only a crude knowledge of this important instrument and suggested that inspectors see that they are proficient in the following: The laws of deviation and variation and the application of such in the correctness of courses and bearings; the use of the dumb card or polaris in determining the deviation, in shaping a course and in compensating a compass; the essentials of an efficient compass; the chief points to be considered when selecting a position for a compass on board ship, and what should be particularly guarded against; the method of compass adjustment.

Active work is now being pushed in Washington for the improvement of the Chicago river by two delegations of Chicago citizens. Mr. Robert J. Dunham represents the River Improvement association and Messrs. Walter Mills, R. B. Ennie and Henry H. Walker represent the Real Estate board. The committee from the Real Estate board will ask congress to appropriate \$1,250,000 for improvements to the outer pier and breakwater and the dredging of the outer basin adjoining the new lake front part. In this petition the River Improvement association does not occur. In the river and harbor bill now before the house of representatives there is an item of \$200,000 for improving the north pier and the association will not ask that any more be spent for work outside the river. All it will ask is that an equal amount be appropriated for dredging the river properly where the channel has not already been deepened by the Dredge Canal board, the work to begin after the lowering or removal of the tunnels, April 1, 1906.

### TOTAL ENTRANCES AT BRITISH PORTS

Liverpool, Jan. 25.—The official returns of trade and navigation for the year 1904 have just been issued by the British board of trade, and Americans will gather from a careful perusal of the following figures reliable facts as to the growth and volume of this country's shipping, so large a proportion of which is in the hands of the British ship owner. The total entrances at British ports during the year amounted to 39,941,807 tons, as compared with 39,903,017 tons in 1903, and 37,904,313 tons in 1902, the increase over the two years thus being 38,880 tons and 2,037,584 tons respectively. Of last year's tonnage entered, British ships represented 27,807,003 tons, an increase of 358,502 tons over 1903, and an increase of 2,006,428 tons over 1902; while last year's foreign entrances were 12,134,804 tons, a decrease of 319,712 tons as compared with 1903, but an increase of 31,156 over 1902.

The clearances from British ports show an even greater expansion. The total tonnage cleared with cargoes amounted to 48,400,364 tons, an increase of 1,066,308 tons over 1903, and of 3,064,276 over 1902. British shipping represented 31,803,297 tons, an increase of 576,873 tons over 1903, and of 2,358,589 over 1902. Foreign shipping reached 16,573,067 tons, an increase over 1903 and 1902 of 489,525 tons and 1,305,687 tons respectively. The share of the different merchant navies

in the carrying trade to and from British ports is best seen in the following table:

Nationality.	Entered tons.	Cleared, tons.
British .....	27,807,003	31,803,297
Russian .....	561,070	579,947
Swedish .....	1,419,819	1,740,238
Norwegian .....	2,539,318	2,701,300
Danish .....	902,731	1,054,920
German .....	1,055,213	2,092,411
Dutch .....	1,563,942	1,783,179
Belgian .....	481,739	644,192
French .....	1,003,066	1,195,068
Spanish .....	1,095,927	1,271,126
Portuguese .....	15,317	18,252
Italian .....	230,991	510,396
Austro-Hungarian .....	163,659	478,071
Greek .....	135,827	347,505
U. S. A. ....	278,432	239,005
Other countries .....	82,153	115,957

A further fact which is worth a passing notice, viz., that over nine-elevenths of the increase in the country's foreign shipping trade has gone to the British flag. The greatest trade is with the United States of America, though compared with 1903 there is a great falling off and there is a decrease compared even with 1902. The tonnage entered at British ports from the United States during 1904 amounted to 6,871,316, and the clearances from here, 5,373,701, against entrances 7,382,838 tons, and clearances 6,138,589 tons in 1903. Practically the whole of this large trade is a monopoly for British shipping, for last year we carried 6,111,914 tons, of the entrances, and 4,764,620 tons, of the clearances. Our nearest competitor is so far, namely the United States itself, that the total tonnage both ways is only little over half a million tons. Naturally the colonial carrying trade has also the appearance of monopoly. The total entrances into British ports from the colonies amounted to 7,246,473 tons, of which the British share was 6,637,852 tons; the clearances for the colonies reached 7,329,516 tons, the British share being 6,959,353 tons. The share of foreign ships in this trade is chiefly in the hands of the Norwegians and the Germans. The Norwegians interfere most in the trade from the North American colonies to this country, but their tonnage this way is only 200,830 tons, as against 1,813,291 tons in British ships, which of the clearances from British ports to Canada, etc., British ships account for 1,476,738 tons, against 36,850 tons in Norwegian vessels. The Germans divide their favors, but do most with Australia and New Zealand. A further examination of the figures of the European countries Britain does shipping business with, finds France and Germany in leading places with Spain, Holland and Belgium good runners-up, while a large tonnage is also sent to Italy. The entrances from Germany reached 2,612,675 tons, and of this British ships represent 1,592,770 tons, and German ships 802,654 tons. The clearances to Germany were 4,868,559 tons, the share of British ships being 2,374,672 tons, and German ships 1,708,817 tons. The entrances from France were 2,752,477 tons, and British ships represent 1,832,889 tons and French ships 702,135 tons. The clearances to France reached 4,879,812 tons, made up of British ships, 3,185,991 tons, French ships, 802,882 tons, and Spanish ships, 362,464 tons. The general coasting trade reached 31,628,303 tons in 1904, against 31,085,768 tons in 1903, and 30,930,932 tons in 1902. It is practically all under the British flag, foreign ships last year accounting for less than a quarter of a million tons. As one authority on British shipping observes, it will require a great deal of ingenuity to write "Decadence" across these returns.

The annual prize of the Naval Institute open to United States naval officers all over the world and awarded for the best paper on any naval subject has been won by Commander Bradley A. Fisk whose paper was on "American Naval Policy." Honorary mention was won by Rear Admiral S. B. Luce on his paper entitled "The Department of the Navy."



## BRITISH SHIPPING NOT PROTECTED

Editor Marine Review: May I be allowed to enter an expostulation against the reiterated statements in the Marine Review relative to protected British shipping. Week after week we have it dinned into us that British shipping is assisted and fostered by government, thus handicapping the carrying trade of the United States, whereas as a matter of fact, British shipping is less looked after or cared for by its government than that of any of the principal maritime nations.

I do not mean to suggest that the Marine Review, in its zeal for the protection of the American marine has any intention to make false statements for the purpose of catching votes, but the articles and cartoons are decidedly misleading to the uninitiated and it would be fairer to those who wish to form their opinion from facts, if the case was presented a little more impartially.

The British "tramp" who penetrates to every and the remotest corners of the seas—and makes it pay, gets absolutely no assistance from government in any shape or form. He has more severe regulations to observe than many continental-owned vessels; Lloyds and Board of Trade load lines are lower than that of some of the other registration societies and in the matter of wages Great Britain pays higher than all but American. A foreign vessel may go into Cardiff, load down to the scuppers, leave port undermanned or unseaworthy, pays nothing more in light or dock dues than British and be under no regulation whatever; a Norwegian chief engineer gets about \$40 per month, and the rest of the crew pro rata; an English engineer in same class of boat gets \$85 and others of the personnel in proportion. The British boat is at a disadvantage in every way, and I have yet to learn where the state aid comes in.

I could mention some of the causes why I believe the British tramp succeeds where others fail; that, however, is not the purpose of this letter, which is written as a protest against the repeated assertion that British shipping is protected. A few first class lines receive bounties for constructing their fast vessels to act as cruisers or scouts and to be available for national service in time of war; the remuneration of this is but nominal, yet, as we are unfortunately nearly always at war somewhere or other, the chartering of these boats as troopships, etc., produces a certain amount of "government assistance" and there is the eclat due to the right to fly the blue ensign and label the vessels R. N. R., which may induce a few passengers to give these boats the preference.

Perhaps you call the mail contracts state aid. These are open to public competition and are by no means confined to British lines; the Messageries Maritimes have carried the English mails to China in conjunction with the P. & O. since steamers first went out to the Orient; the service is inefficient owing to frequent breakdowns, strikes at Marseilles, etc., but we stick to the French mail as an old friend, as long as they care to tender as low as their competitors. The Norddeutscher Lloyd also carries a portion of the English mails, so do other foreign lines. Three years ago the Ocean Steamship Co. (Alfred Holt's Blue Funnel Line), put in a bid for the mails; their ships are the most modern things afloat and although carrying cargoes of 10,000 tons reach Hong Kong almost as soon as the mail which left London at the same time; they carry no passengers and do not lay out to be a "swell" line but they made a bid for the mails. It was "not thought advisable to change existing arrangements." Government protection?

Here in Hong Kong, last year, were put on the river two smart and well equipped steamers, built in France, the ship builder received a bounty from the French government, the owners were to receive a subsidy on their running. They were to run from a British port to Canton, not even touching any

French territory. (We cannot run a vessel between here which is British and the neighboring French colonies without paying differential duties.) The Hong Kong, Canton & Macao Steamboat Co., a first class concern as old as the colony, protested to government against being thus handicapped by interlopers, but no notice was taken; and in spite of the support the new company received they failed within the first year from causes within and not from any discrimination on the part of the British authorities.

I could multiply instances where it appears that our government do everything to discourage shipping enterprise instead of supporting it, but do not wish to make the letter too long. What I think is only due to your readers is for you to show, by facts and figures, where and how the British government assist their nationals to an extent sufficient to give them an advantage over foreigners.

Yours truly,

W. G. WINTERBURN.

Hong Kong, Jan. 2, 1905.

Mr. W. G. Winterburn, the author of this communication, is the general manager of George Fenwick & Co., general engineers and ship builders, Hong Kong, China. The report of the commissioner of navigation shows that the amount paid by Great Britain annually for mail service is \$4,874,243, for general service, \$62,369 or a total of \$5,536,612. This is exclusive of the new Cunard subsidy of \$1,100,000 for the projection of the fast turbine steamship line on the north Atlantic. In the report of the Merchant Marine Commission lately filed in congress the following sentence occurs:

"Great Britain pays generous mail subsidies to her chief steamship lines, admiralty subsidies to her fastest vessels and retainer bounties to many thousands of her seamen." Continuing the commission says:

"The most frequent form of national assistance is the mail subvention to larger lines. Great Britain is the pioneer and chief exemplar in the policy of mail subventions. She began this practice on a large scale with the Cunard Line in 1839-40, and since that time has expended between \$250,000,000 and \$500,000,000 in creating and sustaining her mail lines to every great port and market on this planet. It is sometimes urged by those who desire to believe that a consistent free trade policy has been maintained by the British government that these enormous British subventions were bestowed merely to carry the colonial mails with no purpose whatever to encourage British ocean trade or navigation. But that this academic view is wholly superficial and untenable is demonstrated by the British government itself. A report of the parliamentary committee on contract packets in 1853 on the Cunard and other subsidies thus speaks with authority as to the actual purpose of these generous subventions:

"The objects which appear to have led to these contracts, and to the larger expenditures involved, were to afford as rapid, frequent and punctual communications with distant ports which feed the main arteries of British commerce, and with the most important of our foreign possessions, to foster maritime enterprise and to encourage the production of a superior class of vessels, which would promote the convenience and wealth of the country in time of peace and assist in defending its shores against hostile aggression.

"Indeed, some of the heaviest British expenditures were not in the colonial service at all, but for lines not only to the United States, but to Colon, Brazil and Argentina—in other words, to absolutely foreign lands. At least one of the British subsidized companies—the Pacific Steam Navigation—touched at no British port, but traversed the west coast of South America. Lindsay, the historian of British shipping,

says of this enterprise, that was established by an American merchant who first sought aid unsuccessfully at Washington:

The extension of British influence and British commerce was doubtless the chief inducement for supporting this communication between the Republic of New Granada, Bolivia, Peru and Chile, the nature and extent of that traffic rendering it necessary for the English to maintain mercantile establishments in the chief ports and towns of the western coast of the Pacific, and thus justifying the government in incurring this expense.

"This fixed British practice of creating, by generous subvention, steamship lines 'for the extension of British influence and British commerce' continues to the present time. The new Cunard contracts, involving the virtual gift of two great steamers with a subvention of \$1,100,000 a year, is a recent case in point. Another is the grant of a \$200,000 subvention for a new 14-knot steam line to the West Indies. And still another—a little earlier—is the subvention of \$291,000 to a British line of three ships for a service from Vancouver, British Columbia, across the North Pacific to Japan and China—a notable illustration of the generosity and courage with which England pushes her shipping interests," wrote the late Hon. Wm. C. Whitney in his annual report as secretary of the navy. "Under such competition," Mr. Whitney added, "it is quite easy to conjecture what will become of the American flag and our resources in the way of a naval reserve in the North Pacific."

"Close alongside these heavily subsidized British steamers, out of the American ports of Tacoma and Seattle, a few miles southward, now run two large and three smaller American steamships, competing with the British line for freight and passenger traffic to and from the Orient. These American steamers received last year for carrying the United States mails the munificent sum of \$4,935. Close alongside the American steamers, right out of Puget sound, runs a Japanese line, the Nippon Yusen Kaisha, which receives an annual subsidy of \$330,000 from the Japanese government, and was given last year \$4,857 for carrying the United States mails.

The Marine Review has never said to its knowledge that the British tramp steamer was subsidized. On the contrary it has stated that they are so numerous that it would be impossible to subsidize them. What it has stated, however—and this view is supported by the Merchant Marine Commission—is that indirectly they have shared in the general policy of national encouragement. The first British tramp steamers of years ago were built in yards and engined by machine shops that had been created and developed by the parliamentary establishment of ocean lanes of trade which were pursued exclusively by British steamers. It is well known that when a business is once established and things are running smoothly that it is up-hill work for others to get a foothold in that trade. All that the American merchant marine asks is that it may be aided by its government as the British lines were aided by their government until it can meet the overwhelming British influence upon something like an equal footing.

It is reported that the Canadian government is about to make big improvements in the Detroit river abreast of Amherstburg. The plans call for excavating the river to a depth of 21 ft. from the present channel which is now being improved by the United States government. The improvement will make it possible for the largest vessels on the lakes to tie up or coal at the Amherstburg docks.

Capt. Harris W. Baker of Detroit will endeavor to raise the sunken steamer Iron Duke which burned off Charlotte, N. Y., last fall. The rails of the steamer are about 2 ft. under water.

## SUBSIDIARIES OF BETHLEHEM STEEL

Announcement was made in New York this week of the organization of the subsidiary companies of the Bethlehem Steel Corporation as follows:

Harlan & Hollingsworth Corporation, Wilmington, Del.—Chairman of the board, Edward M. McIlvain; president, David C. Reid; treasurer and assistant secretary, Henry S. Snyder; assistant treasurer, S. K. Smith; secretary, Henderson Weir. Board of directors, Edward M. McIlvain, Adolphe E. Borie, Henry S. Snyder, David C. Reid, and John A. McGregor. Executive committee, Edward M. McIlvain, David C. Reid, and John A. McGregor.

Bath Iron Works Co., Bath, Me.—Chairman of the board, Edward M. McIlvain; president, E. W. Hyde; vice-president, J. S. Hyde; treasurer and assistant secretary, Henry S. Snyder; secretary and assistant treasurer, H. H. McCarthy. Board of directors, Edward M. McIlvain, Adolphe E. Borie, Henry S. Snyder, E. W. Hyde, and J. S. Hyde. Executive committee, Edward M. McIlvain, E. W. Hyde, and Adolphe E. Borie.

Eastern Shipbuilding Corporation, Groton, Conn.—Chairman of the board, Edward M. McIlvain; president, C. R. Hanscom; vice-president, Adolphe E. Borie; treasurer and assistant secretary, Henry S. Snyder; secretary and assistant treasurer, Frank M. Swift; board of directors, Edward M. McIlvain, Adolphe E. Borie, Henry S. Snyder, C. R. Hanscom, and Oliver Wren; executive committee, Edward M. McIlvain, Henry S. Snyder, and C. R. Hanscom.

Cataract Improvement Co., Cataract, N. J.—President and chairman of the board, Edward M. McIlvain; vice-president, Adolphe E. Borie; secretary and treasurer, Henry S. Snyder; board of directors, Edward M. McIlvain, Adolphe E. Borie, Henry S. Snyder, John A. McGregor, and Oliver Wren; executive committee, Edward M. McIlvain, Adolphe E. Borie, and Henry S. Snyder.

Samuel L. Moore & Sons Corporation, Elizabeth, N. J.—Chairman of the board, Edward M. McIlvain; president, James S. Stirling; vice-president, Adolphe E. Borie; treasurer and assistant secretary, Henry S. Snyder; secretary and assistant treasurer, Joseph H. Blanchard; board of directors, Edward M. McIlvain, Adolphe E. Borie; Henry S. Snyder, James S. Stirling, and Joseph H. Blanchard; executive committee, Edward M. McIlvain, James S. Stirling, and Joseph H. Blanchard.

Crescent Shipyard Corporation, Elizabeth, N. J.—Chairman of the board, Edward M. McIlvain; president, James S. Stirling; vice-president, Adolphe E. Borie; treasurer and assistant secretary, Henry S. Snyder; secretary and assistant treasurer, Joseph H. Blanchard; board of directors, Edward M. McIlvain, Adolphe E. Borie, Henry S. Snyder, James S. Stirling, and Joseph H. Blanchard; executive committee, Edward M. McIlvain, James S. Stirling, and Joseph H. Blanchard.

The British ship Cypromene has been converted into an oil carrier and named the Monterey. Tanks capable of holding about 20,000 bbls. of oil have been built in her hold in such a manner as to insure safety. Her pumps enable her to take a full cargo on board in about six hours. She will carry oil from the Californian port of Monterey to northern Pacific ports. Though she will be towed from port to port, she can spread enough fore and aft canvas to enable her to sail, if the breaking of a hawser or other circumstances render it necessary. American register has been granted to the Monterey.

Cobb, Butler & Co., Rockland, Me., has closed contract to build a four-masted lumber schooner for Capt. M. V. B. Brewster of Port Jefferson, New York.

### OUTPUT OF ENGINES AND BOILERS

Richardsons, Westgarth & Co., Hartlepool, England, sent to the Review the following list of the output of engines and boilers for 1904:

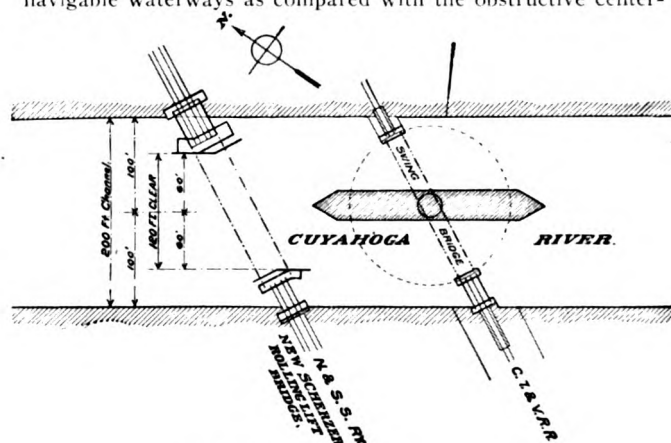
Steamers Inkula, 3,000 I. H. P.; Orscolo, 2,200; Canada Cape, 2,000; Agincourt, 2,000; Hillbrook, 1,750; Crane, 1,750; Stork, 1,750; Rugbeian, 1,700; Waddon, 1,700; Harcalo, 1,650; Germanic, 1,650; Claremont, 1,650; Harmonic, 1,650; Greenbank, 1,650; Oldhamia, 1,650; Lincairn, 1,650; Parthenon, 1,600; Katherine, 1,550; Dagmar, 1,550; Pontop, 1,550; Adriatic, 1,500; Majestic, 1,500; Furtor, 1,450; Dowlais, 1,400; Rosemount, 1,400; Windermere, 1,350; Whinfield, 1,300; Ladykirk, 1,300; Adamton, 1,300; Childar, 1,100; Progresso, 1,000; Longhirst, 1,000; Hauk, 700; Falk, 700; Cherrybrook, 650; Ravn, 600; Grace, 470; Hurricane, 350; twenty-eight sets of land engines, including Parsons' turbines, Cockerill gas engines, steam and gas blowing engines, Easton & Anderson pumping engines, 25,370; seventy-nine Independent boilers, including marine, Nesdrum water-tube and Blake, 12,900; total indicated horse power for year, 92,990.

### PERSONAL

Mr. J. R. Mills, who has been manager of sales in the Cleveland office of the Carnegie Steel Co., has been given the position of assistant manager of sales in the St. Louis office. Mr. John Scott, who has been in charge of the New Orleans

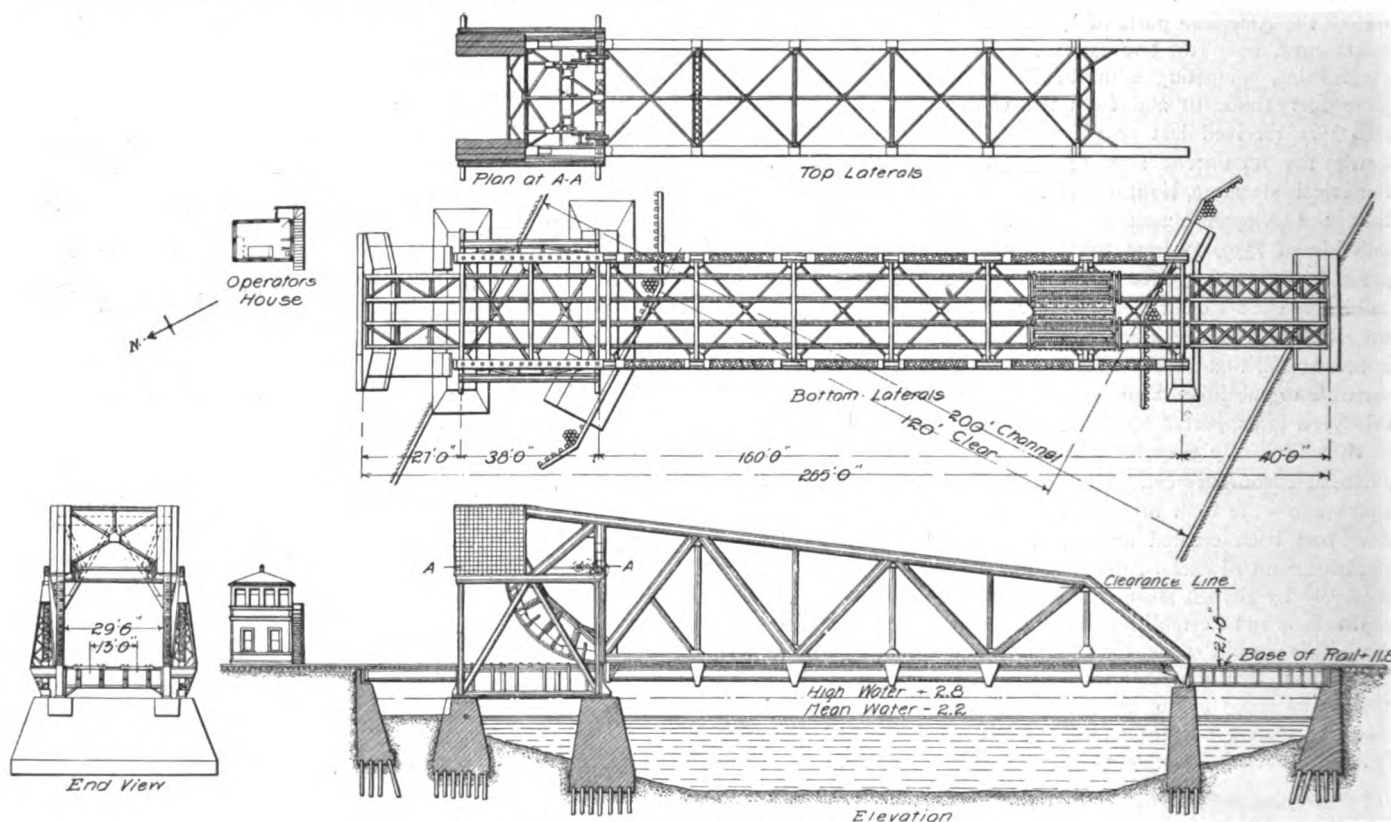
### REMOVING OBSTRUCTIONS TO NAVIGATION

The Marine Review has, from time to time, published descriptions of Scherzer rolling lift bridges constructed for railroad, street railroad and highway traffic and called attention to the many advantages of this modern type of bridge for navigable waterways as compared with the obstructive center-



PLAT OF THE SITE OF BRIDGES.

pier swing bridges, which must be removed and replaced to accommodate the passage of modern vessels. During the past ten years more than sixty Scherzer rolling lift bridges have



GENERAL DESIGN OF THE BRIDGE.

office of the company, has been appointed to the Cleveland vacancy.

Mr. G. A. Tomlinson of Duluth who visited Europe directly after the annual meeting of the Lake Carriers' association at Detroit, has returned to this country.

Capt. Truman Moore, retired, of Lorain, has been offered the post of harbor-master of that port.

Contract has been awarded the Risdon Iron Works, San Francisco, to replace the dredge Chinook at a cost of \$21,310.

been constructed and placed under construction to take the place of center-pier swing bridges at the principal marine centers in the United States and abroad. In this issue is illustrated the new Scherzer rolling lift bridge recently constructed for the Newburgh & South Shore Railway Co. This bridge is the longest simple truss span bascule bridge yet constructed and has attracted wide and favorable attention among American and foreign engineers and vessel interests because of its simplicity, efficiency and the great improvement it affords for navigation in contrast with center-pier swing bridges and

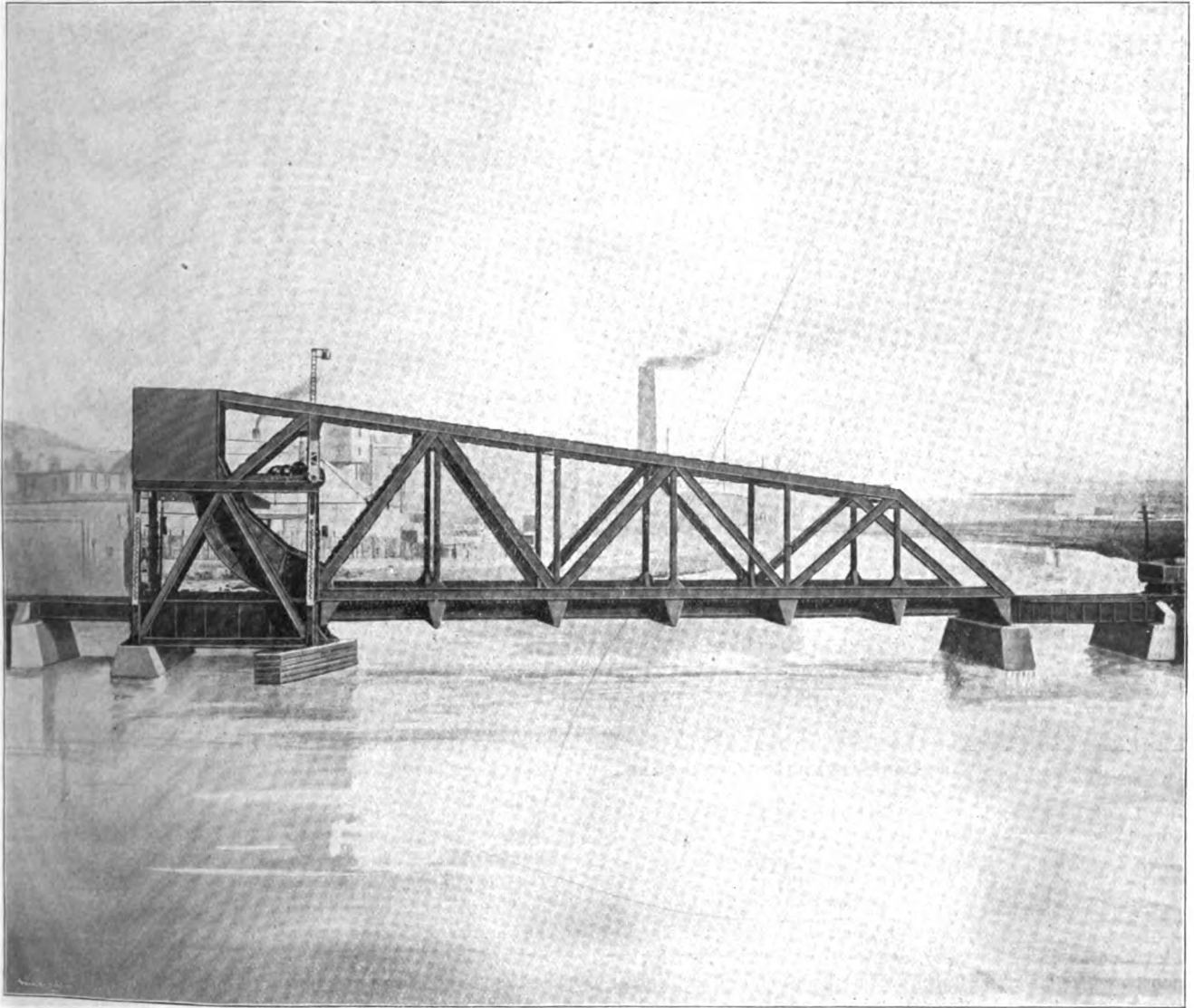


especially with the adjacent center-pier swing bridge of the Cleveland Terminal & Valley railroad. This swing bridge is also to be removed and replaced this year with a modern Scherzer rolling lift bridge, practically a duplicate of the Scherzer rolling lift bridge of the Newburgh & South Shore Railway Co.

The Newburgh & South Shore railway forms the connecting link for the heavy traffic between the furnaces of the American Steel & Wire Co., located on the east bank of the Cuyahoga river, Cleveland, and the mills of the American

to the center line of the river. This necessitated a movable span of 160 ft. from center to center of bearings, as the new bridge crosses the river at an angle of  $60^{\circ} 30' 30''$ . The general design of the bridge is shown in Fig. 2. Fig. 3 shows the bridge in the closed position for railroad traffic. Fig. 4 shows the bridge partially opened to permit the passage of a moderate sized vessel. It is only necessary to open the bridge fully for the passage of large-masted vessels.

The principal features of this bridge are as follows: The movable superstructure is composed of a single-leaf, simple



BRIDGE IN CLOSED POSITION FOR RAILROAD TRAFFIC.

Steel & Wire Co., located at Newburgh. In the construction of the railway it was necessary to cross the Cuyahoga river on a double track movable bridge, a short distance from the center-pier swing bridge of the Cleveland Terminal & Valley railroad, now being replaced by a Scherzer rolling lift bridge.

Fig. 1 represents a plat of the site of these bridges and shows the obstruction to navigation caused by the center-pier and protection pier of the Cleveland Terminal & Valley railroad swing bridge blocking the middle of the channel. After a very careful investigation of the various type of movable bridges, the Newburgh & South Shore Railway Co. decided to construct a double-track Scherzer rolling lift bridge. The requirements of the city of Cleveland and the war department called for a clear channel to accommodate navigation 120 ft. wide, measured between protection fenders, at right angles

to the center line of the river. This necessitated a movable span of 160 ft. from center to center of bearings. The operating power provided is composed of two 50-H. P. continuous current electric motors, but this large bridge has from the beginning operated so easily that less than 20-H. P. is actually used in ordinary weather. The tracks are interlocked with mechanism for locking the bridge, so that the operator cannot operate the bridge until the proper signals and derailing switches are set to prevent the passage of trains. The bridge is counterbalanced so as to be at rest in all positions, and when closed to receive railroad traffic, forms a simple and very rigid truss span, resting firmly on two supports. The rails weigh 100 lbs. per yard, and, unlike the shifting rails common to swing bridges, are firmly fastened at all points. The superstructure is composed of Portland cement concrete piers resting on piles. The piles for the two



BRIDGE PARTIALLY OPENED TO PERMIT PASSAGE OF MODERATE-SIZED VESSEL.

main piers are cut off at the bottom of the channel, the piles for the rear pier and abutments being cut off at a considerably higher elevation.

The entire work was executed under the charge of Mr. H. L. Schuler, chief engineer of the Newburgh & South Shore Railway Co. The Scherzer Rolling Lift Bridge Co., 1616 Monadnock block, Chicago, furnished the detail plans for the substructure, superstructure, operating machinery and operating equipment. They also maintained a general consulting engineering supervision over the construction of the bridge.

#### TRADE NOTES

The Westcott Chuck Co., Oneida, N. Y., have just put out a well bound and well printed catalogue descriptive of Westcott's patent combination lathe chuck. It is represented that it will give all the movements and conveniences obtainable in both the independent and universal chucks at a much less cost than for both. It is therefore economy to buy the combination chuck. The movements are independent, universal and eccentric. The jaws of all of Westcott's lathe chucks are reversible. It is not necessary to buy an extra set of jaws. The same set can be used by simply reversing. The catalogue is profusely illustrated, contains sectional drawings and descriptions and full price lists. It will be sent to anyone interested upon request.

The Fort Wayne Electric Works, Fort Wayne, Ind., has

just issued Bulletin No. 1061 devoted to the multiphase induction integrating type K wattmeters. This meter is made much on the same principles as the popular single phase type K; but in addition to the features common to single and multiphase type K meters, the multiphase meter has the advantage of higher torque and complete registration of all energy in the multiphase circuit on a single dial plate. The catalogue is extensively illustrated and will be furnished upon demand. In addition it will interest those who are preserving these bulletins to know that an index may be obtained for them.

The transfer of the A. S. Cameron Steam Pump Works' agency at Birmingham, Ala., to the Crane Co., was made on account of the sale of the Milner & Kettig Co.'s stock to their successors, the Crane Co. Mr. W. H. Kettig, formerly president of the Milner & Kettig Co. is local manager for the Crane Co. The Crane Co. has already taken over the stock of the Cameron pumps which will enable them to supply the trade in their vicinity.

Through their agents, The Miller Supply Co. of Huntington, W. Va., the A. S. Cameron Steam Pump Works, foot of East 23d street, New York, are in receipt of an order for a 5 by 12 power-driven pump, to be used for the water supply of the Crescent Glass Co. of Weston, W. Va. The pump is composition fitted and will have a capacity of 150,000 gallons per day at ordinary speed.





VOL. XXXI.

CLEVELAND, O., FEBRUARY 23, 1905.

No. 8.



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CLEVELAND, OHIO.

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Fig. 100.  
"Moore" Anti-Friction  
Chain Hoist.

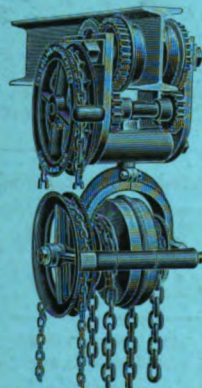


Fig. 111.

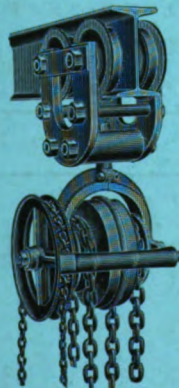


Fig. 114.

**Trolleys and Hoists.**

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Fig. 200.  
"Standard" Screw  
Chain Hoist.



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Established 1857.

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We have completed our new IRON FOUNDRY, and are prepared to execute orders for Castings, guaranteeing first-class work, prompt service and reasonable prices.

**SHIP MACHINERY** EMBODYING THE LATEST DESIGNS AND MANY  
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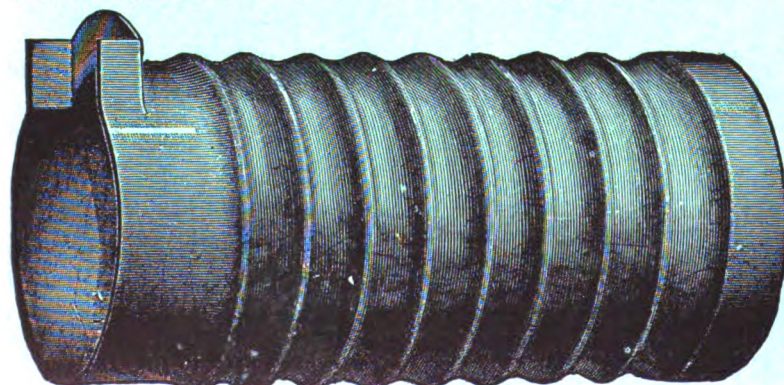
## Original and Only Automatic Steam Towing Machine.

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# MORISON SUSPENSION BOILER FURNACES



## FOR LAND AND MARINE BOILERS.

UNIFORM THICKNESS—EASILY CLEANED  
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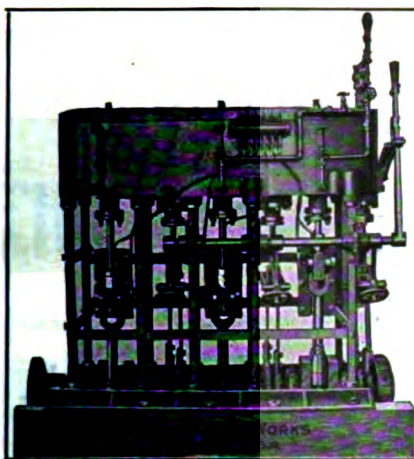
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West and Calyer Sts., NEW YORK.

Near 10th and 23d Sts. Ferries.

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## Marine Engines, Boilers and Equipment.

In sizes 15 to 500 H.P.

Strictly modern and first-class Marine Work at fair prices.

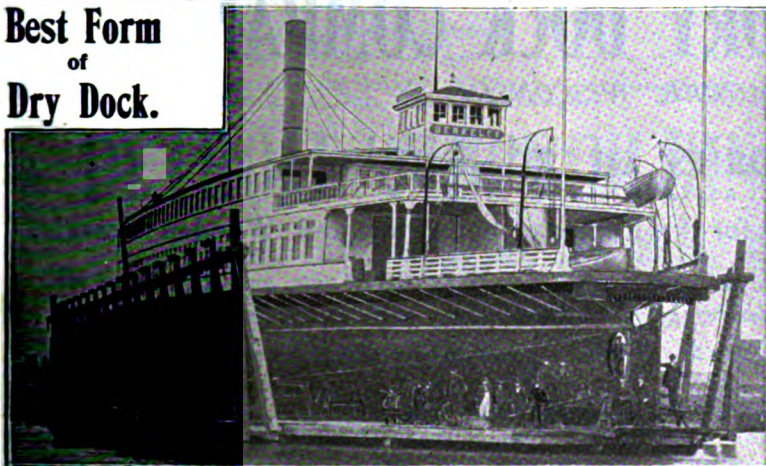
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Built of Steel or Wood  
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Anywhere and everywhere that an injector can be used the U. S. AUTOMATIC INJECTOR is regarded as invincibly superior and supreme. It instantly wins favor with every practical engineer, because of its great simplicity, durability and reliability.

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Each U. S. INJECTOR is carefully tested and its capacity and range certified to. Buy from your dealer. Demand the genuine—"U. S." stamped on each.

## The Success and Safety of the Plant depend on the ENGINEER and the INJECTOR

The best way to insure yourself against Injector troubles is to insist on the

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It has a record for satisfactory service that cannot be approached by any other injector made. The aggregate sales equal the combined sales of all other automatic injectors on the market. Its simplicity, reliability, economy and durability have made it the universal favorite. Seldom in need of repairs, but easy to repair when new parts are necessary, without leaving the factory.

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Largest manufacturers of  
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Steel Ship Builders and  
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Ship Repairs of all kinds.

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Two Largest Dry Docks on the Lakes.

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No. 1, foot Weddell St., 547 ft. x 65 ft. x 15 ft. 6 in.  
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Marine and  
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Boilers and  
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Sole Agents for the Lakes for the Ellis & Eaves Induced Draft System, as applied to boilers, giving increased power and great economy.

Prompt Attention Given to Ship Repairs of All Kinds

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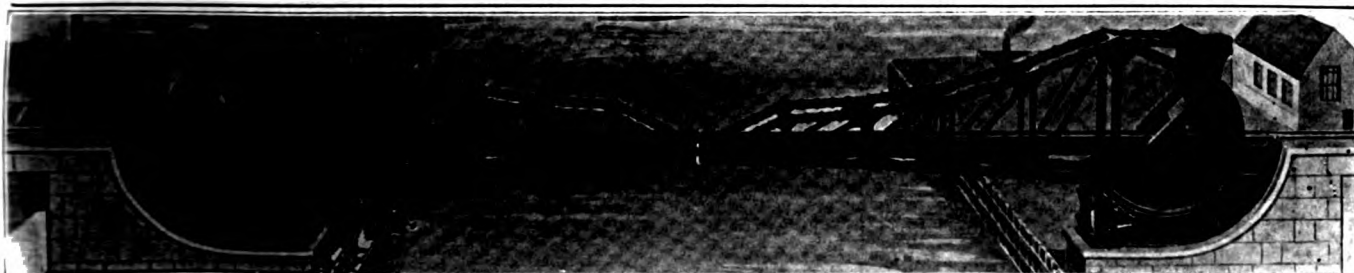
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Ship and Engine Builders, Detroit, Mich.

Sole Owners for the Lakes and Atlantic Coast of the HOWDEN HOT DRAFT SYSTEM as applied to Boilers, giving increased power and great economy.

Steel Ship Yard Located at Wyandotte, Michigan.

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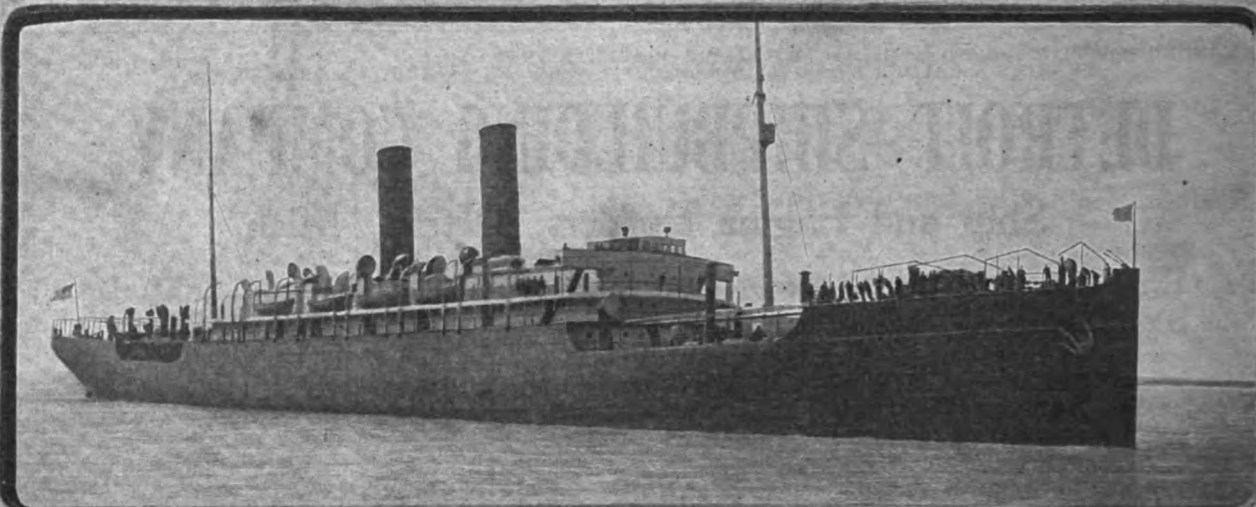
METAL - AND - WOODEN - SHIP - BUILDERS.

New Dry Dock—525 feet long, 110 feet wide on top,  
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Repairs to Metal and Wooden Ships  
A SPECIALTY.

# OUR SHIPYARD

WITH ITS ACCOMPANYING DRY DOCKS  
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BATTLE SHIPS · ARMORED CRUISERS ·  
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After four years of investigation, the Boiler Committee appointed by the British Admiralty have unanimously declared that water tube boilers are more suitable for Naval purposes than cylindrical, and have again placed THE BABCOCK & WILCOX at the head of all types.

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Adopted by the English, German, French, Russian and United States Light House Departments for Channel and Harbor Lighting; over 1800 gas buoys and gas beacons in service. : : : :

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of iron or steel in the rough, or finished complete, and all kinds of light and heavy forgings up to 50 tons in weight.

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of charcoal iron or soft steel; also stay tubes, locomotive tubes and boiler tubes of all sizes.

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92



CLYDE LINE APACHE



U.S. BATTLESHIP MAINE



THE  
WM.  
**CRAMP**  
— & SONS —  
**SHIP & ENGINE BUILDING Co.**  
ESTABLISHED 1830

I.P. MORRIS COMPANY  
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**WARSHIPS AND MERCHANT STEAMERS**  
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 Repairs to all classes  
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LARGE TURBINE



VIEW OF ONE OF OUR DRY DOCKS



Philadelphia



# THE NICLAUSSE BOILER.

The largest merchantmen in the world, the S. S. Minnesota and Dakota, of 33,000 tons and 11,000 H. P. each, are equipped with Niclausse Boilers.

641,000 HORSE POWER IN THE NAVIES OF ELEVEN NATIONS.

THE NEW JAPANESE CRUISERS, KATORI AND KASHIMA, OF 16,000 H. P. EACH, AND IN THE UNITED STATES NAVY THE ARMORED CRUISERS PENNSYLVANIA AND COLORADO, 23,000 H. P. EACH, AND THE BATTLESHIPS GEORGIA AND VIRGINIA, 19,000 H. P. EACH, WILL BE FITTED WITH THESE BOILERS.

THE ONLY WATER-TUBE BOILER SUCCESSFULLY USED AND PROVED IN LARGE SHIPS.

Requires no space at sides or rear—cleaned from the front.

Employs no tube-caps—tubes can readily be withdrawn without mutilation.

FORGED STEEL THROUGHOUT.

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1,800 Feet of Dock.

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Docks. —PENNSYLVANIA R. R.  
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—TOLEDO AND OHIO CENTRAL R. R.

SMITH'S COAL DOCK, Detroit River, DETROIT, MICH.

12 Pockets.

Platform.

Low Dock.

Operated by STANLEY B. SMITH & CO.

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# PITTSBURG COAL COMPANY.

Steamboat Fueling Facilities at Various Points on the Great Lakes:

CLEVELAND HARBOR { 4 Car Dumpers.  
3 Lighters.

FAIRPORT HARBOR { 1 Car Dumper.  
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Fuel Pockets.

DETROIT RIVER BRANCH { Docks and Pockets at  
Sandwich and Amherstburg.

SAULT RIVER BRANCHES { Dock and Pockets at Detour.  
Dock and Pockets at Sault Ste. Marie. (The Port Royal Dock Co.)

WE FURNISH ONLY  
THE BEST GRADE OF

## Pittsburg and Youghioghenny Coal.

GENERAL OFFICE, LAKE DEPARTMENT, PERRY-PAYNE BUILDING, CLEVELAND, OHIO.

# Steel Castings

from 100 to 75,000 lbs.

# Otis Steel

"Otis" Fire Box Plates a Specialty.

Ship Plates  
Flange Plates  
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Forgings of all kinds

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AGENCIES.

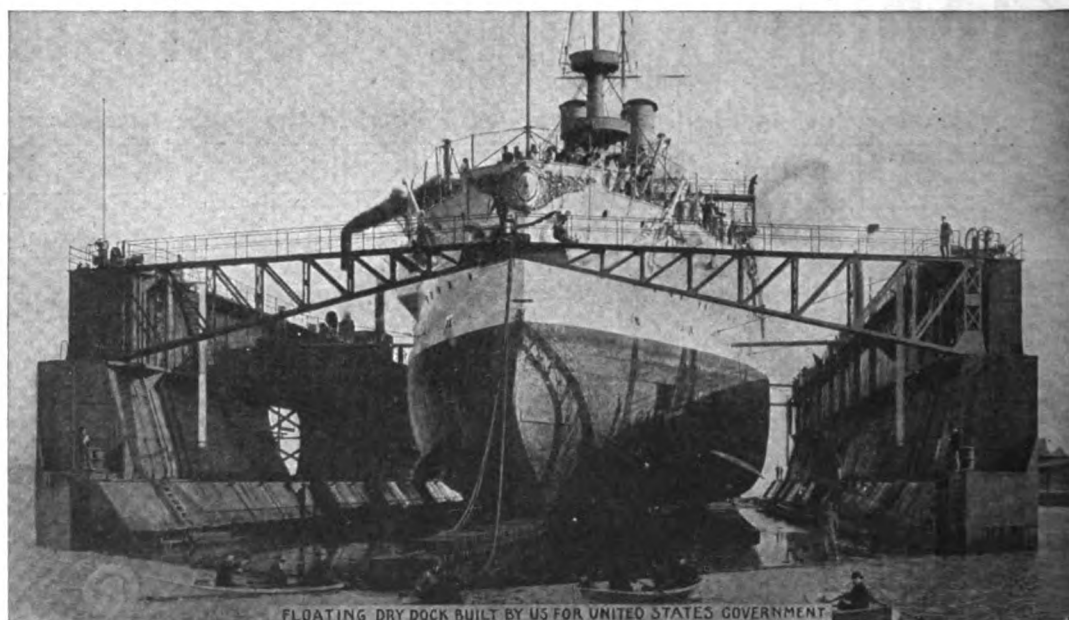
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BUILDERS OF STEEL STEAMSHIPS,  
TOW BOATS, SAILING VESSELS,  
BARGES AND STEAM CRAFT  
OF EVERY DESCRIPTION

STEEL FLOATING DRY DOCKS  
CAPABLE OF DOCKING  
THE LARGEST VESSELS



FLOATING DRY DOCK BUILT BY US FOR UNITED STATES GOVERNMENT

SPARROW'S POINT,  
MARYLAND.

# Gold Medal

Awarded Dearborn Methods of Treating  
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### The "Diamond" Steam Flue Blower.

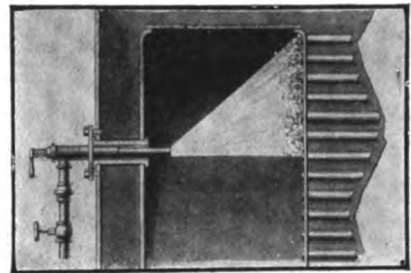


The Diamond Blower.

This machine will be sent on trial to any responsible house with the full privilege of retaining or returning same.

### SOMETHING NEW.

The "Diamond" Blower is the outcome of many years' experience and hard labor and meets the demand so often made for a commonsense method of removing soot from boilers. We give you below the points of merit in one division and the points of demerit in the other for your consideration.



Diamond Blower in Operation.

#### The New Method of Cleaning Boilers vs.

##### Economical and Thorough.

Cleans all tubes their entire length in five minutes.

No loss of steam pressure—No opening of brichings—No slackening of machinery.

##### Effective.

Placed in rear wall of boiler, works with the natural draught of boiler and blows soot out the chimney and absolutely prevents the accumulation of soot. A simple turn of the handle sets the blower in operation and can be turned on and off at will.

Keeps flues thoroughly cleaned and insures maximum boiler efficiency.

##### Saves Money.

Permanent fixture—first small cost only expense. Saves wages of firemen. Saves cost of hose. Saves fuel and time.

#### The Old Method of Cleaning Boilers

##### Wasteful.

An attempt to clean each tube singly with steam hose consumes at least thirty minutes each time and does not accomplish the purpose.

Results in reduction of steam pressure, loss of power, slackening of machinery.

##### Ineffective.

Working against natural draft, it is impossible to reach accumulations of soot at rear end of boiler tubes.

Soot forced from one tube is sucked by the natural draught of the boiler into another. For every tube cleaned another is filled up with soot.

##### Expensive.

Labor of fireman an expense without result as the flues cannot be cleaned this way. Hose wears out quickly and has to be frequently replaced, a source of continual expense, shirking of duty.

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Do not these points appeal to you? It will be to your interest to investigate the matter carefully.



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Suitable for all Boats from 3½ to 200 HP. Over 100 in successful use.

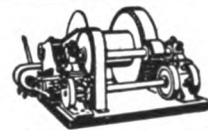
Also the well known and always reliable Woolters Gas or Gasolene Stationary Engines.



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Of all kinds and sizes, and for all purposes, especially for ship use.

Docking and Hauling Engines and Wire Rope Windlasses.



#### AUTOMATIC TOWING MACHINES

Somewhat the cheapest, and altogether the best. Positively guaranteed.

Automatic Fog Whistle Machines Steam Steering Engines.

FOR THESE AND OTHER WELL KNOWN SPECIALTIES ADDRESS ALL INQUIRIES TO.

**THE CHASE MACHINE CO. Engineers and Machinists, CLEVELAND, OHIO.**

# New York Shipbuilding Company

Main office and works, Camden, N. J., New York office No. 1 Broadway

**Builders of**  
**SHIPS — ENGINES — BOILERS**  
**HEAVY MACHINERY**



Launch of "Mongolia," Pacific Mail S. S. Co., July 25, 1903.  
615 feet long, 65 feet beam, 51 feet deep.

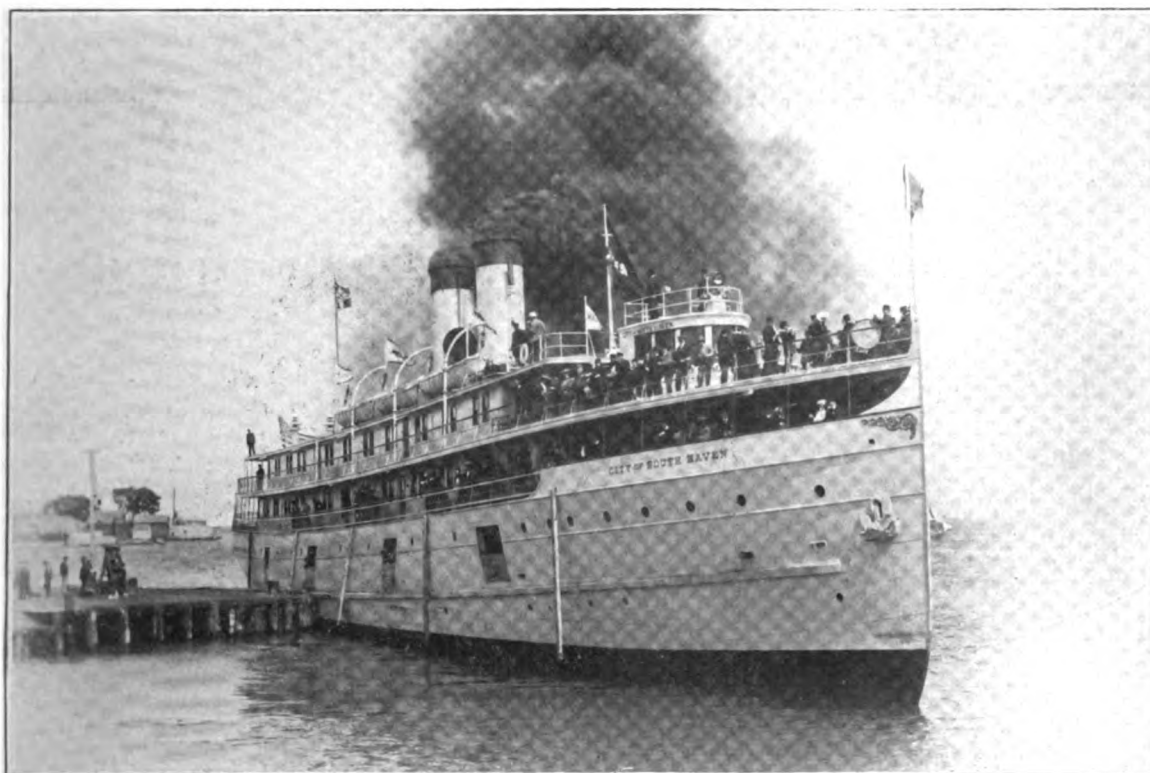
## Best Facilities for Repair Work

**Pneumatic and Electric Tools;  
ample wharfage accomodation.**

**100 ton crane.**

**Repairs done under shelter.**





## The City of South Haven

one of the fleetest of the Great Lakes Passenger Steamers, is fitted with six, five hundred horse power,

## Dearing Water Tube Boilers.

*Scientific Construction* has brought DEARING WATER TUBE BOILERS to the front, and they are everywhere acknowledged

### THE PERFECTION OF THE WATER TUBE SYSTEM.

They are far in advance of all other Water Tube Boilers. Every vital part is constructed on a scientific basis and the results secured prove their superiority for all purposes.

You should know the whole story! A letter to us and we will make some things plain to you.

**DEARING WATER TUBE BOILER CO.,**  
DETROIT, MICHIGAN.

*Some Territories  
Open for Agencies.*

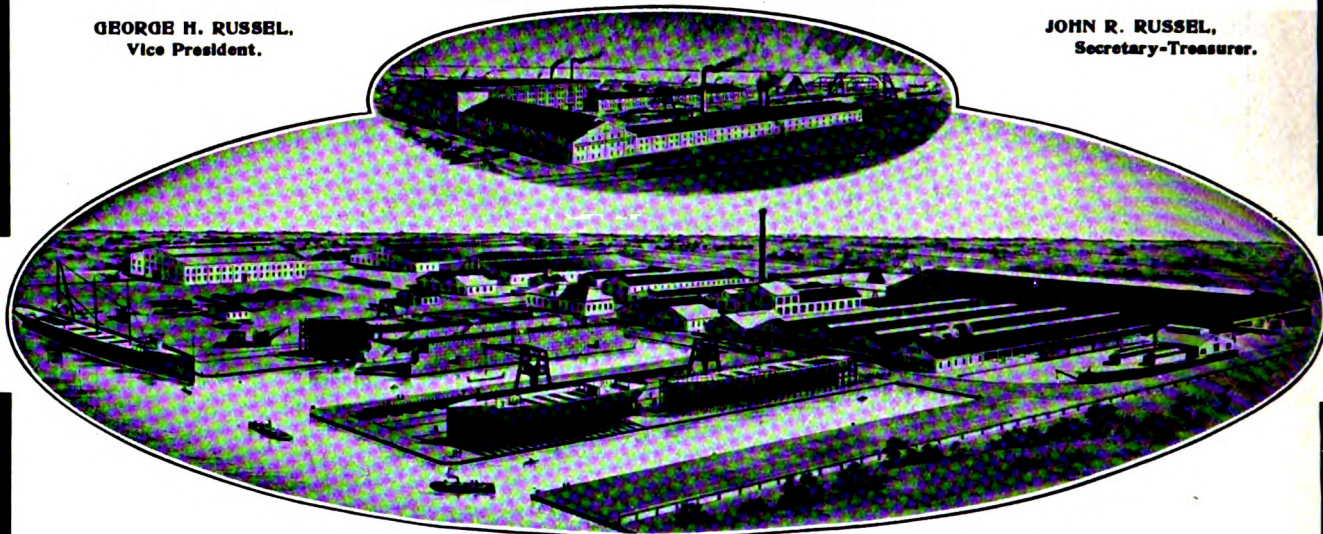
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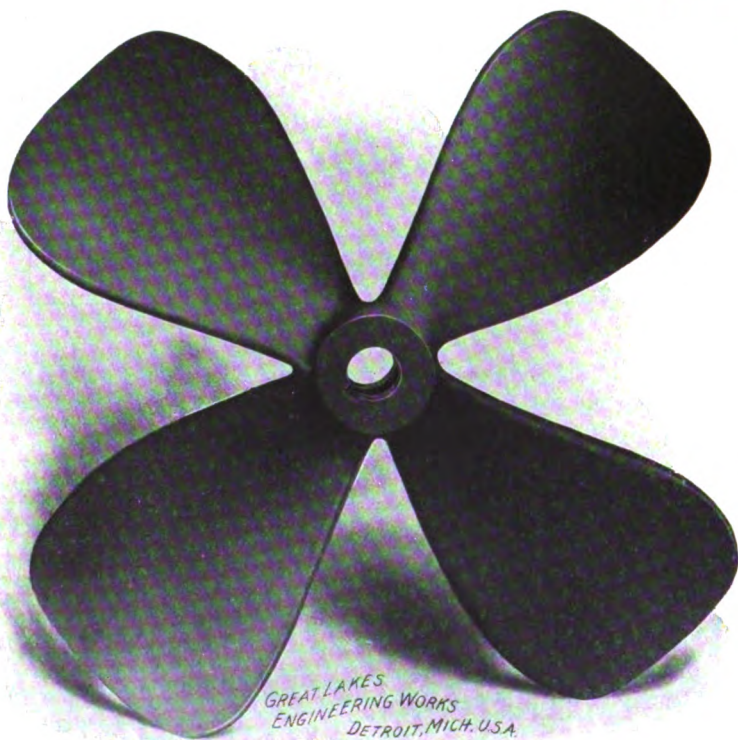
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## Semi-Steel **Propeller** **Wheels==**

made either Solid or im-  
proved Sectional Type.

Our Wheels possess  
many points of merit not  
found in other makes.

**Quick deliveries  
guaranteed.**



# BELLEVILLE WATER-TUBE BOILERS

NOW IN USE (MARCH, 1904)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	-	-	-	-	-	-	-	-	355,560 H. P.
English Royal Navy	-	-	-	-	-	-	-	-	966,300 "
Russian Imperial Navy	-	-	-	-	-	-	-	-	224,500 "
Japanese Imperial Navy	-	-	-	-	-	-	-	-	122,700 "
Austrian Imperial Navy	-	-	-	-	-	-	-	-	56,700 "
Italian Royal Navy	-	-	-	-	-	-	-	-	13,500 "
Chilian Navy	-	-	-	-	-	-	-	-	26,500 "
Argentine Navy	-	-	-	-	-	-	-	-	13,000 "
The "Messageries Maritimes" Company	-	-	-	-	-	-	-	-	87,600 "
Chemins de fer de l'Ouest: (The French Western Railway Co.)	-	-	-	-	-	-	-	-	Steamships
plying between Dieppe and Newhaven	-	-	-	-	-	-	-	-	18,500 "
Total Horse Power of Boilers in Use									1,884,860

## Société Anonyme des Etablissements Delaunay Belleville

CAPITAL: 8,000,000 FRANCS

Works and Dock Yards of the Ermitage at Saint-Denis (Seine), France.

Telegraphic Address: Belleville, Saint-Denis-Sur-Seine



Star Metaline  
Bushings.  
SELF-OILING.

### NEW METAL CARGO HOISTERS

Wrought Iron Hook and  
Strap, Galvanized Iron  
Shells and Sheaves.  
Sheaves fitted with Genu-  
ine Star Metaline Bush-  
ings with Metaline Side  
Bearings.

These Blocks Save the Rope and Outwear all others.

Send for No. 15 Catalogue M. A. R. FREE.

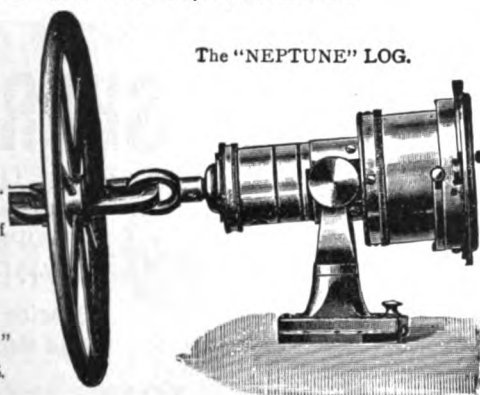
Manufactured only by  
**BOSTON & LOCKPORT BLOCK CO.,**

BOSTON, MASS.

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## THOMAS WALKER & SON, BIRMINGHAM, ENGLAND.

THE  
"NEPTUNE"  
SHIP-LOG  
With  
Ball Bearings  
for  
HIGH  
SPEEDS.  
Also makers of  
the  
"CHERUB"  
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"HARPOON"  
SHIP-LOGS.



The "NEPTUNE" LOG.

MAKERS TO THE BRITISH NAVY.



### ASHTON

Cam Lever Pop Safety Valves  
and Non-Corrosive  
Steam Gauges.

give highest efficiency and durability.  
Specify them and get the best.

**The Ashton Valve Co.**

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### THE SAME DAY

that your order reaches us shipment  
is made. Structural Steel, Tubes,  
Sheets, Plates, Pipe, etc.—a full line.

SEE OUR MONTHLY STOCK LIST.

THE  
**BOURNE-FULLER CO.**

IRON, STEEL  
PIG IRON  
COKE

Cleveland, Ohio



# WANTED and FOR SALE Department.

## PROPOSALS.

**PROPOSALS FOR DREDGE.**—Mississippi River Commission, Fullerton Building, St. Louis, Mo., Jan. 16, 1905.—Sealed proposals, in triplicate, for construction and delivery of self-propelling hydraulic dredge and ponton pipe line will be received here until 12 noon, standard time, March 17, 1905, and then publicly opened. Information furnished on application. WM. B. LADUE, Capt., Eng'rs, Sec'y. Mar. 9

**U. S. ENGINEER OFFICE,** Jones Building, Detroit, Mich., Feb. 6, 1905. Sealed proposals for hire of dredging plant for use in Lake St. Clair will be received at this office until 2 p. m. (standard time) March 8, 1905, and then publicly opened. Information furnished on application. Chas. E. L. B. Davis, Lieut. Col., Eng'rs. Mar. 2

## FOR SALE.

### Steam Barge for Sale.

For Sale.—Steam barge, 131 ft. keel, 25 ft. beam, 9 ft. deep. Capacity, lumber, 260 M. ft.; coal, 400 tons. Good power; can handle two or three barges. Everything pertaining to this boat is in good condition. Terms cash. Address Lock Box 35, St. Clair, Mich. Feb. 26

### Steamers for Sale.

Steamers Russell Sage and John C. Gault. Complete fit-out for package freight; electric light plant, etc. For particulars apply to A. W. Colton, Gen. Mgr., Toledo, O. Mar. 16

## FOR SALE.

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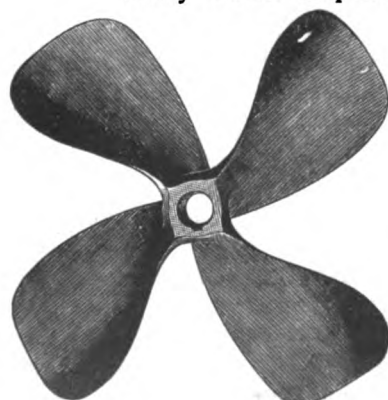
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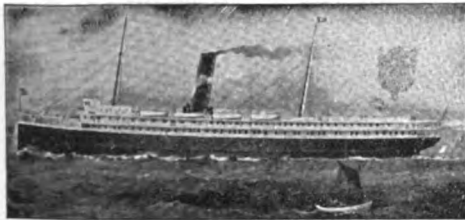
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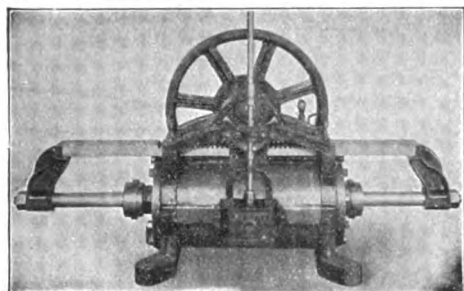
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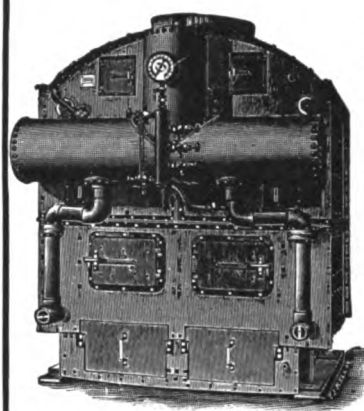
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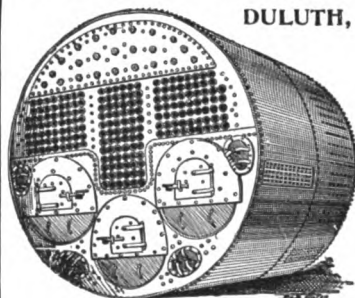
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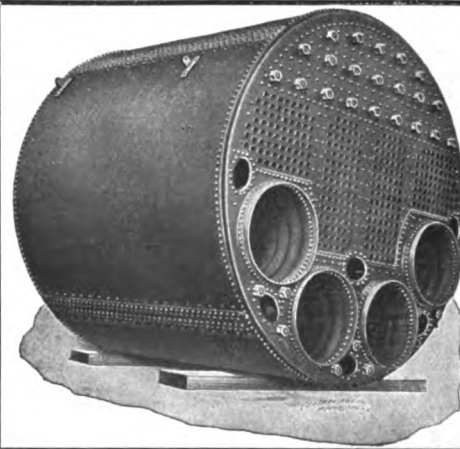
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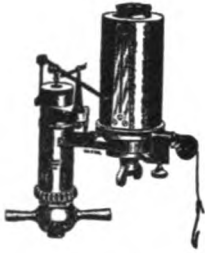
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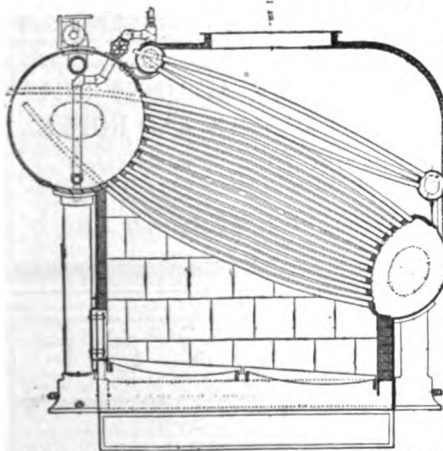
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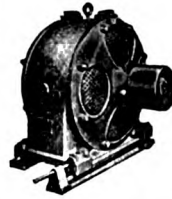
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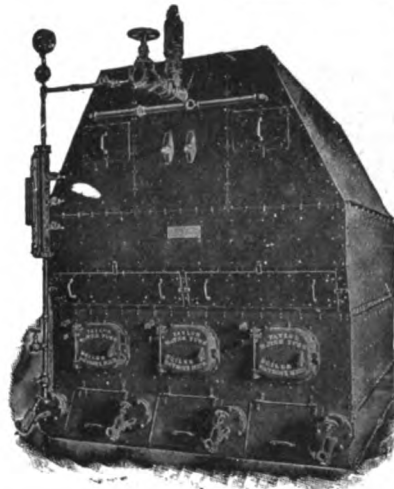
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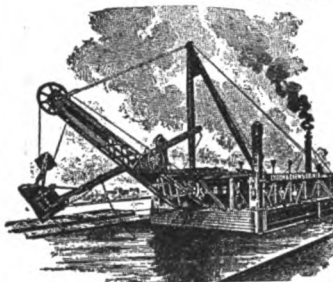
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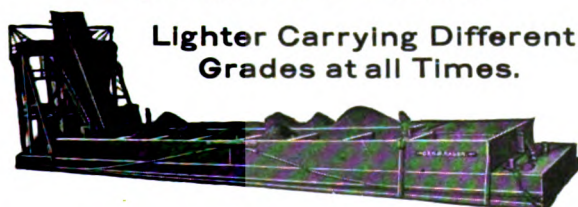
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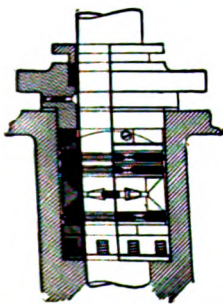
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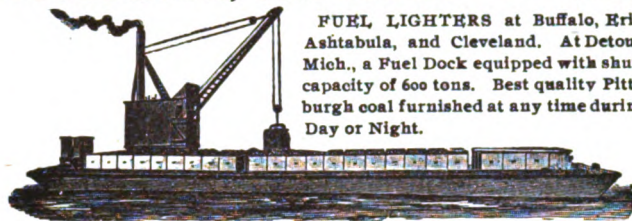
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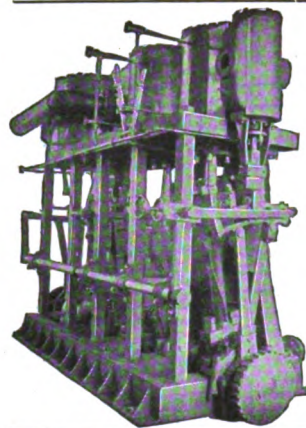
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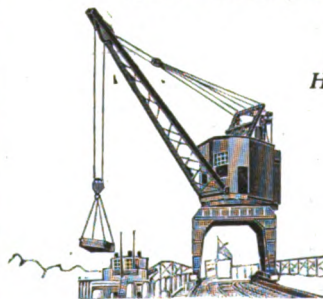
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Newport News Ship Building Co. ....  
..... Newport News, Va.  
New York Shipbuilding Co. .... Camden, N. J.  
Northwestern Steam Boiler & Mfg. Co. ....  
..... Duluth, Minn.  
Roach's Ship Yard .... Chester, Pa.  
Sheriffs Mfg. Co. .... Milwaukee.  
Superior Ship Building Co. .... Superior, Wis.  
Thropp, J. E. & Sons Co. .... Trenton, N. J.  
Trout, H. G. .... Buffalo.  
Willard, Chas. P. & Co. .... Winthrop Harbor, Ill.

**ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.**

Cory, Chas. & Son. .... New York.  
Marine Mfg. Supply Co. .... New York.

**ENGINE TESTING.**

Kreer & Parsons. .... Chicago.

**ENGINEERING SPECIALTIES AND SUPPLIES.**

Crane Co. .... Chicago.  
Kieley & Mueller. .... New York.  
Lunkenheimer Co. .... Cincinnati.  
New York Belting & Packing Co. .... New York.  
Northwestern Steam Boiler & Mfg. Co. ....  
..... Duluth, Minn.

**ENGINEERS, MARINE, MECHANICAL, CONSULTING.**

Hynd, Alexander. .... Cleveland.  
Hunt, Robt. W. & Co. .... Chicago.  
Kidd, Joseph. .... Duluth, Minn.  
Kreer & Parsons. .... Chicago.  
Lovejoy, H. O. .... Buffalo.  
Matteson & Drake. .... Philadelphia.  
Mosher, Chas. D. .... New York.  
Nacey, James. .... Cleveland.  
Rice, Henry. .... Buffalo.  
Roelker, H. B. .... New York.  
Wood, W. J. .... Chicago.

**FANS FOR VENTILATION, EXHAUST, ETC.**

Sturtevant, B. F. Co. .... Hyde Park, Mass.

**FEED WATER PURIFIERS AND HEATERS.**

Reilly Repair and Supply Co., Jas. .... New York  
Ross Valve Co. .... Troy, N. Y.

**FIXTURES FOR LAMPS, OIL OR ELECTRIC.**

General Electric Co. .... Schenectady, N. Y.  
Westinghouse Electric & Mfg. Co. ....  
..... Pittsburgh, Pa.

**FORGES.**

Sturtevant, B. F. Co. .... Boston.

**FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.**

Cleveland City Forge & Iron Co. .... Cleveland.  
Fore River Shipbuilding Co. .... Quincy, Mass.  
Macbeth Iron Co. .... Cleveland.

**FLUE WELDING.**

Fix's, S. Sons. .... Cleveland.

**FUEL ECONOMIZERS.**

Sturtevant Co., B. F. .... Hyde Park, Mass.

**FUELING COMPANIES AND COAL DEALERS.**

Hanna, M. A. & Co. .... Cleveland.  
Parker Bros. Co., Ltd. .... Detroit.  
Picklands, Mather & Co. .... Cleveland.  
Pittsburg Coal Co. .... Cleveland.  
Smith, Stanley B., & Co. .... Detroit.  
Smith Coal & Dock Co., Stanley B. Toledo, O.

**FURNACES FOR BOILERS.**

Continental Iron Works. .... New York.

**GASKETS, RUBBER.**

New York Belting & Packing Co. .... New York.

**GAS BUOYS.**

Safety Car Heating & Lighting Co. .... New York.

**GAS AND GASOLINE ENGINES.**

Chase Machine Co. .... Cleveland.  
Georgian Bay Engineering Works. ....  
..... Midland, Ont.  
Reliance Mfg. Co. .... Providence, R. I.

**GAUGES, STEAM AND VACUUM.**

American Steam Gauge & Valve Mfg. Co. ....  
..... Boston.  
Ashton Valve Co. .... Boston.  
Lunkenheimer Co. .... Cincinnati.

**GAUGES, WATER.**

Bonner & Co., Wm. T. .... Boston.  
Lunkenheimer Co. .... Cincinnati, O.

**GRAPHITE.**

Dixon Crucible Co., Joseph. .... Jersey City, N. J.

**HAMMERS, STEAM.**

Chase Machine Co. .... Cleveland.

**HATCH COVERS.**

American Canvas & Tarpaulin Corp. .... Buffalo.

**HEATING APPARATUS.**

Sturtevant, B. F. Co. .... Hyde Park, Mass.

**HOISTS FOR CARGO, ETC.**

American Ship Building Co. .... Cleveland.  
Brown Hoisting Machinery Co. (Inc.) ....  
..... Cleveland.  
Chase Machine Co. .... Cleveland.  
General Electric Co. .... New York.  
Georgian Bay Engineering Works. ....  
..... Midland, Ont.  
Hyde Windlass Co. .... Bath, Me.  
McMyler Mfg. Co. .... Cleveland.  
Marine Iron Co. .... Bay City.  
Mietz, Aug. .... New York.  
Westinghouse Electric & Mfg. Co. ....  
..... Pittsburgh, Pa.

**HOLLOW STAYBOLT IRON.**

Falls Hollow Staybolt Co. .... Cuyahoga Falls, O.

**HOSE, RUBBER.**

New York Belting & Packing Co. .... New York.

**HYDRAULIC DREDGES.**

Great Lakes Engineering Works. .... Detroit.

**HYDRAULIC TOOLS.**

Watson-Stillman Co., The. .... New York.

**ICE MACHINERY.**

Great Lakes Engineering Works. .... Detroit.  
Roelker, H. B. .... New York.

**INDICATORS FOR STEAM ENGINES.**

American Steam Gauge Co. .... Boston.  
Ashton Valve Co. .... Boston.

**INJECTORS.**

American Injector Co. .... Detroit.  
Crane Co. .... Chicago.  
Jenkins Bros. .... New York.  
Lunkenheimer Co. .... Cincinnati.  
Penberthy Injector Co. .... Detroit, Mich.

**INSURANCE, MARINE.**

Elphicke, C. W. & Co. .... Chicago.  
Fleming & Co., E. J. .... Chicago.

**INSURANCE, MARINE—Continued.**

Gilchrist & Co., C. P. .... Cleveland.  
Hawgood & Co., W. A. .... Cleveland.  
Helm & Co., D. T. .... Duluth.  
Hutchinson & Co. .... Cleveland.  
McCarthy, T. R. .... Montreal.  
McCurdy, Geo. L. .... Chicago.  
Mitchell & Co. .... Cleveland.  
Parker Bros. Co., Ltd. .... Detroit.  
Peck, Chas. E. & W. F. .... New York & Chicago.  
Prindiville & Co. .... Chicago.  
Richardson, W. C. .... Cleveland.  
Sullivan, D. & Co. .... Chicago.

**IRON CASTINGS.**

Reading Iron Co. .... Reading, Pa.

**IRON ORE AND PIG IRON.**

Bourne-Fuller Co. .... Cleveland, O.  
Hanna, M. A. & Co. .... Cleveland.  
Pickands, Mather & Co. .... Cleveland.  
Reading Iron Co. .... Reading, Pa.

**LAMPS, INCANDESCENT.**

Westinghouse Elec. & Mfg. Co. .... Pittsburgh, Pa.  
Sawyer-Man Electric Co. .... Pittsburgh, Pa.

**LAUNCHES—STEAM, NAPHTHA, ELECTRIC.**

Georgian Bay Engineering Works. ....  
..... Midland, Ont.  
Marine Iron Works. .... Chicago.  
Truscott Boat Mfg. Co. .... St. Joseph, Mich.  
Willard, Chas. P. .... Winthrop Harbor, Ill.

**LIFE PRESERVERS, LIFE BOATS, BUOYS.**

Armstrong, Cork Co. .... Pittsburgh.  
Drein, Thos. & Son. .... Wilmington, Del.  
Kahnweiler's Sons, D. .... New York

**LIGHTS, SIDE AND SIGNAL.**

Russell & Watson. .... Buffalo.

**LOGS.**

Walker & Sons, Thomas .... Birmingham, Eng.  
Also Ship Chandlers.

**LUBRICATING GRAPHITE.**

Dixon Crucible Co., Joseph. .... Jersey City, N. J.

**LUBRICATORS.**

Crane Co. .... Chicago.  
Lunkenheimer Co. .... Cincinnati.

**LUMBER.**

Martin-Barriss Co. .... Cleveland.

**MACHINISTS.**

Chase Machine Co. .... Cleveland.  
Hickler Bros. .... Sault Ste. Marie, Mich.  
Lockwood Mfg. Co. .... East Boston, Mass.

**MACHINE TOOLS (WOOD WORKING).**

Atlantic Works, Inc. .... Philadelphia.

**MARINE RAILWAYS.**

Hickler Bros. .... Sault Ste. Marie, Mich.

**MARINE RAILWAYS, BUILDERS OF.**

Crandall & Son, H. I. .... East Boston, Mass.

**MATTRESSES, CUSHIONS, BEDDING.**

Fogg, M. W. .... New York.

**MECHANICAL DRAFT FOR BOILERS.**

American Ship Building Co. .... Cleveland.  
Detroit Ship Building Co. .... Detroit.  
Great Lakes Engineering Works. .... Detroit.  
Sturtevant, B. F. Co. .... Hyde Park, Mass.

**METALLIC PACKING.**

Katzenstein, L. & Co. .... New York.

**METAL POLISH.**

Bertram's Oil Polish Co. .... Boston

**MOTORS, GENERATORS—ELECTRIC.**

Fisher Electrical Works. .... Detroit.  
General Electric Co. .... Schenectady, N. Y.  
Sturtevant, B. F. Co. .... Hyde Park, Mass.  
Westinghouse Electric & Mfg. Co. ....  
..... Pittsburgh, Pa.



## Buyers' Directory of the Marine Trade.—Continued.

**NAUTICAL INSTRUMENTS.**

Ritchie, E. S., &amp; Sons.....Brookline, Mass.

**NAVAL ARCHITECTS.**

Hynd, Alexander .....Cleveland.  
 Kidd, Joseph.....Duluth, Minn.  
 Kreer & Parsons.....Chicago.  
 Lovejoy, H. O.....Buffalo.  
 Matteson & Drake.....Philadelphia.  
 Mosher, Chas. D.....New York.  
 Nacey, James.....Cleveland.  
 Rice, Henry.....Buffalo.  
 Wood, W. J.....Chicago.

**OAKUM.**

Stratford, Oakum Co.....Jersey City, N. J.

**OIL ENGINES.**

Miets, Aug. ....New York.

**OILS AND LUBRICANTS.**

Dixon Crucible Co., Joseph.....Jersey City, N. J.  
 Standard Oil Co.....Cleveland.

**PACKING.**

Crane Co. ....Chicago.  
 Jenkins Bros. ....New York.  
 Katzenstein, L. & Co.....New York.  
 New York Belting & Packing Co.....New York.

**PACKING TOOL.**

Matteson &amp; Drake .....Philadelphia.

**PAINTS.**

Baker, Howard H. & Co.....Buffalo.  
 Carbolineum Wood Preserving Co.....Milwaukee.  
 New Jersey Zinc Co.....New York.  
 Upson-Walton Co. ....Cleveland.

**PATTERN SHOP MACHINERY.**

Atlantic Works, Inc.....Philadelphia.

**PILE DRIVING AND SUBMARINE WORK.**

Buffalo Dredging Co.....Buffalo.  
 Chicago & Gt. Lakes Dredge & Dock Co.....Chicago.  
 Dunbar & Sullivan Dredging Co.....Buffalo.  
 Fitz-Simons & Connell Co.....Chicago.  
 Hickler Bros. ....Sault Ste. Marie, Mich.  
 Lake Superior Contracting & Dredging Co.....Duluth, Minn.  
 Parker Bros. Co., Ltd.....Detroit.  
 Smith Co., L. P. & J. A.....Cleveland.  
 Starke Dredge & Dock Co., C. H.....Milwaukee.  
 Sullivan, M. ....Detroit.

**PIPE, WROUGHT IRON.**

Bourne-Fuller Co.....Cleveland, O.  
 Crane Co. ....Chicago.  
 Macbeth Iron Co.....Cleveland.  
 Reading Iron Co.....Reading, Pa.

**PLANING MILL MACHINERY.**

Atlantic Works, Inc.....Philadelphia.

**PLATES—SHIP, STRUCTURAL, ETC.**

Bourne-Fuller Co.....Cleveland, O.  
 Otis Steel Co.....Cleveland.  
 Reading Iron Co.....Reading, Pa.

**PRESSURE REGULATORS.**

Kieley & Mueller .....New York.  
 Ross Valve Co.....Troy, N. Y.

**PROPELLER WHEELS.**

American Ship Building Co.....Cleveland.  
 Atlantic Works .....East Boston, Mass.  
 Cramp, Wm. & Sons.....Philadelphia.  
 Detroit Ship Building Co.....Detroit.  
 Fore River Shipbuilding Co.....Quincy, Mass.  
 Great Lakes Engineering Works.....Detroit.  
 Hyde Windlass Co.....Bath, Me.  
 Lockwood Mfg. Co.....East Boston, Mass.  
 Marine Iron Works .....Chicago.  
 Milwaukee Dry Dock Co.....Milwaukee.  
 Newport News Ship Building Co.....Newport News, Va.  
 Roelker, H. B. ....New York.  
 Sheriffs Mfg. Co.....Milwaukee.  
 Superior Ship Building Co.....Superior, Wis.  
 Thropp & Sons Co., J. E.....Trenton, N. J.  
 Trout, H. G. ....Buffalo.

**PROJECTORS, ELECTRIC.**

General Electric Co.....Schenectady, N. Y.  
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

**PUMPS FOR VARIOUS PURPOSES.**

Blake, Geo. F., Mfg. Co.....New York.  
 Great Lakes Engineering Works .....Detroit.  
 Marine Iron Works .....Chicago.  
 Kingsford Foundry & Machine Works.....Oswego, N. Y.

**REFRIGERATING APPARATUS.**

Great Lakes Engineering Works.....Detroit.  
 Roelker, H. B. ....New York.

**REGISTER FOR CLASSIFICATION OF VESSELS.**

Great Lakes Register .....Cleveland.  
 Record of American & Foreign Shipping.....New York.

**REPAIRS—ENGINE AND BOILER.**

(See also Boiler Manufacturers and Engine Builders.)  
 Georgian Bay Engineering Works.....Midland, Ont.

**RIVETS, STEEL FOR SHIPS AND BOILERS.**

Bourne-Fuller Co.....Cleveland, O.

**SAFETY VALVES.**

American Steam Gauge & Valve Mfg. Co.....Boston.  
 Ashton Valve Co.....Boston.  
 Crane Co. ....Chicago.  
 Lunkenheimer Co. ....Cincinnati.

**SAIL MAKERS.**

American Canvas & Tarpaulin Corp ....Buffalo.  
 Baker, Howard H. & Co.....Buffalo.  
 Upson-Walton Co.....Cleveland.

**SALVAGE COMPANIES.**

See Wrecking Companies.

**SEARCH LIGHTS.**

General Electric Co.....Schenectady, N. Y.  
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

**SHEARS.**

See Punches, Rivets, and Shears.

**SHIP AND BOILER PLATES AND SHAPES.**

Bourne-Fuller Co.....Cleveland, O.  
 Otis Steel Co.....Cleveland.  
 Reading Iron Co.....Reading, Pa.

**SHIP BUILDERS.**

American Ship Building Co.....Cleveland.  
 Atlantic Works .....East Boston, Mass.  
 Bertram Engine Works Co., Ltd.....Toronto, Can.  
 Buffalo Dry Dock Co.....Buffalo.  
 Cramp, Wm. & Sons.....Philadelphia.  
 Craig Ship Building Co.....Toledo, O.  
 Chicago Ship Building Co.....Chicago.  
 Detroit Ship Building Co.....Detroit.  
 Fore River Shipbuilding Co.....Quincy, Mass.  
 Great Lakes Engineering Works.....Detroit.  
 Lockwood Mfg. Co.....East Boston, Mass.  
 Maryland Steel Co.....Sparrows Point, Md.  
 Milwaukee Dry Dock Co.....Milwaukee.  
 Newport News Ship Building Co.....Newport News, Va.  
 New York Shipbuilding Co.....Camden, N. J.  
 Roach's Ship Yard .....Chester, Pa.  
 Shipowner's Dry Dock Co.....Chicago.  
 Smith & Son, Abram.....Algonac, Mich.  
 Willard, Chas. P. & Co.....Winthrop Harbor, Ill.

**SHIP CHANDLERS.**

American Canvas & Tarpaulin Corp ....Buffalo.  
 Baker, Howard H. & Co.....Buffalo.  
 Marine Mfg. & Supply Co.....New York.  
 Upson-Walton Co.....Cleveland.

**SHIP DESIGNERS.**

Kidd, Joseph.....Duluth.  
 Kreer & Parsons.....Chicago.  
 Matteson & Drake.....Buffalo.  
 Rice & Lovejoy.....Buffalo.  
 Steel, Nacey & Hynd.....Cleveland.  
 Wood, W. J.....Chicago.

**SHIP LANTERNS AND LAMPS.**

Russell &amp; Watson .....Buffalo.

**SHIP TIMBER.**

Martin-Barriss Co.....Cleveland.

**SMOOTH-ON COMPOUND, FOR REPAIRS.**

Smooth-On Mfg. Co.....Jersey City, N. J.

**STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.**

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.  
 Reading Iron Co.....Reading, Pa.

**STEAM VESSELS FOR SALE.**

Gilchrist & Co., C. P. ....Cleveland.  
 Holmes, Samuel .....New York.  
 Lester, S. S.....Quebec, Can.  
 McCarthy, T. R.....Montreal, Can.

**STEAMSHIP LINES, PASS. AND FREIGHT.**

American Line .....New York.  
 Anchor Line .....Buffalo.  
 Boston Steamship Co.....Boston.  
 International Mercantile Marine Co.....Philadelphia.  
 New York & Cuba Mail S. S. Co.....New York.  
 Red Star Line .....New York.  
 United Fruit Co .....Boston.

**STEEL CASTINGS.**

Otis Steel Co.....Cleveland.

**STEERING APPARATUS.**

American Ship Building Co.....Cleveland.  
 Chase Machine Co.....Cleveland.  
 Detroit Ship Building Co.....Detroit.  
 Hyde Windlass Co.....Bath, Me.  
 Marine Mfg. & Supply Co.....New York.  
 Moulton Steering Engine Co.....New York.  
 Sheriffs Mfg. Co.....Milwaukee.

**SUBMARINE DIVING APPARATUS.**

Morse & Son, A. J.....Boston.  
 Schrader's Son, A.....New York.

**SURVEYORS, MARINE.**

Gaskin, Edward .....Buffalo.  
 Hynd, Alexander .....Cleveland.  
 Lovejoy, H. O.....Buffalo.  
 Matteson & Drake.....Philadelphia.  
 Parker Bros. Co., Ltd.....Detroit.  
 Nacey, James.....Cleveland.  
 Rice, Henry .....Buffalo.  
 Steel, Adam .....Cleveland.  
 Wood, W. J.....Chicago.

**TARPAULINS.**

American Canvas &amp; Tarpaulin Corp ....Buffalo.

**TESTS OF MATERIALS.**

Hunt, Robert W. & Co.....Chicago.  
 Lunkenheimer Co.....Cincinnati, O.

**TILING, INTERLOCKING RUBBER.**

New York Belting &amp; Packing Co.....New York.

**TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.**

Watson-Stillman Co.....New York.

**TOOLS, WOOD WORKING.**

Atlantic Works, Inc.....Philadelphia.

**TOWING MACHINES.**

American Ship Windlass Co.....Providence, R. I.  
 Chase Machine Co.....Cleveland.

**TOWING COMPANIES.**

Donnelly Salvage & Wrecking Co.....Kingston, Ont.

**TRAPS, STEAM.**

Kieley & Mueller .....New York.  
 Sturtevant Co., B. F., .....Hyde Park, Mass.

**TRUCKS.**

Boston &amp; Lockport Block Co.....Boston.

**TUBING, SEAMLESS.**

Shelby Steel Tube Co.....Pittsburg, Pa.

## Buyers' Directory of the Marine Trade.—Continued.

**VALVES, STEAM SPECIALTIES, ETC.**

American Steam Gauge & Valve Mfg. Co. .... Boston.  
 Ashton Valve Co. .... Boston.  
 Crane Co. .... Chicago.  
 Jenkins Bros. .... New York.  
 Kieley & Mueller .... New York.  
 Lunkenhimer Co. .... Cincinnati.  
 Ross Valve Co. .... Troy, N. Y.

**VALVES FOR WATER AND GAS.**

Lunkenhimer Co. .... Cincinnati.  
 Ross Valve Co. .... Troy, N. Y.

**VARNISHES.**

Detroit Varnish Co. .... Detroit.  
 Detroit White Lead Works. .... Detroit.  
 New Jersey Zinc Co. .... New York.  
 Also Ship Chandlers.

**VENTILATING APPARATUS FOR SHIPS.**

Sturtevant, B. F. Co. .... Hyde Park, Mass.

**VESSEL AND FREIGHT AGENTS.**

Boland, John J. .... Buffalo.  
 Brown & Co. .... Buffalo.  
 Elphicke, C. W. & Co. .... Chicago.  
 Fleming & Co., E. J. .... Chicago.  
 Gilchrist & Co., C. P. .... Cleveland.  
 Hall, John B. .... Buffalo.  
 Helm & Co., D. T. .... Duluth.

**VESSEL AND FREIGHT AGENTS—Con.**

Hawgood & Co., W. A. .... Cleveland.  
 Holmes, Samuel .... New York.  
 Hutchinson & Co. .... Cleveland.  
 Lester, S. S. .... Quebec, Can.  
 McCarthy, T. R. .... Montreal.  
 Mitchell & Co. .... Cleveland.  
 Parker Bros. Co., Ltd. .... Detroit.  
 Prindiville & Co. .... Chicago.  
 Richardson, W. C. .... Cleveland.  
 Sullivan, D. & Co. .... Chicago.

**WATER GAUGES.**

Bonner & Co., Wm. T. .... Boston.  
 Lunkenhimer Co. .... Cincinnati, O.

**WATERTIGHT BULKHEAD DOORS.**

"Long Arm" System Co. .... Cleveland.

**WIRE ROPE AND WIRE ROPE FITTINGS.**

Baker, H. H. & Co. .... Buffalo.  
 DeGrauw, Aymar & Co. .... New York.  
 Upson-Walton Co. .... Cleveland.

**WHISTLES, STEAM.**

American Steam Gauge & Valve Mfg. Co. .... Boston.  
 Ashton Valve Co. .... Boston.  
 Lunkenhimer Co. .... Cincinnati.

**WINDLASSES.**

American Ship Windlass Co., Providence, R. I.  
 American Ship Building Co. .... Cleveland.  
 Hyde Windlass Co. .... Bath, Me.  
 Marine Mfg. & Supply Co. .... New York.

**WINCHES.**

American Ship Windlass Co., Providence, R. I.  
 Georgian Bay Engineering Works. ....  
 .... Midland, Ont.  
 Hyde Windlass Co. .... Bath, Me.

**WOOD PRESERVING PAINT.**

Carbolineum Wood Preserving Co. .... Milwaukee.

**WOOD WORKING MACHINERY.**

Atlantic Works, Inc. .... Philadelphia.

**WRECKING AND SALVAGE COMPANIES.**

Donnelly Salvage & Wrecking Co. ....  
 .... Kingston, Ont.  
 Parker Bros. Co., Ltd. .... Detroit.

**YACHT AND BOAT BUILDERS.**

Bertram Engine Works Co., Ltd., Toronto, Can.  
 Drein, Thos. & Son. .... Wilmington, Del.  
 Georgian Bay Engineering Works. ....  
 .... Midland, Ont.  
 Truscott Boat Mfg. Co. .... St. Joseph, Mich.  
 Willard, Chas. P. & Co. .... Winthrop Harbor, Ill.

**YAWLS.**

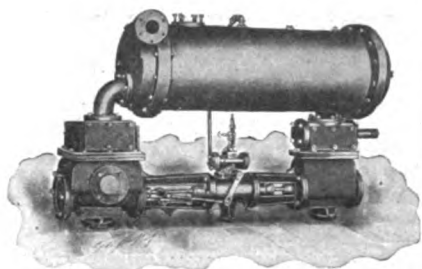
Drein, Thos. & Son. .... Wilmington, Del.

## ALPHABETICAL INDEX OF ADVERTISERS IN THE MARINE REVIEW.

The star (\*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on pages noted.  
 The dagger (†) indicates that advertisement appears once a month.

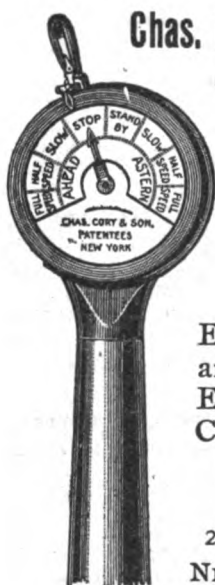
Almy Water Tube Boiler Co. .... 38	Elphicke, C. W. & Co. .... 44	Lake Superior Contracting & Dredging Co. .... 42	Reading Iron Co. .... 7
American Canvas & Tarpaulin Corporation * .....		Lebanon Chain Works .... 50	Record of American & Foreign Shipping .... 40
American Injector Co. .... 3		LeMois Scientifique et Industriel 37	Red Star Line .... 41
American Line .... 41		Lester, S. S. .... 44	Reilly Repair and Supply Co., Jas. * ..
American Ship Building Co. .... 5	Falls Hollow Staybolt Co. .... 38	Lockwood Mfg. Co. .... 37	Reliance Mfg Co. .... 43
American Ship Windlass Co. .... 2	Fitz-Simons & Connell Co. .... 42	"Long Arm" System Co. .... 45	Rice, Henry .... 44
American Steam Gauge Co. .... 39	Fix's Sons, S. .... 50	Lovejoy, H. O. .... 45	Richardson, W. C. .... 44
Armstrong Cork Co. .... 52	Fleming & Co., E. J. .... 40	L. S. & M. S. Ry. .... 51	Ritchie & Sons, E. S. .... 39
Ashton Valve Co. .... 35	Fletcher Co., W. & A. .... 37	Lunkenhimer Co. .... 7	Roberts Safety Water-Tube Boiler Co. .... 45
Atlantic Works .... 37	Fogg, M. W. .... 2		Roelker, H. B. .... 37
Atlantic Works, Inc. .... †	Fore River Shipbuilding Co. .... 37		Ross Valve Co. .... 50
Babcock & Wilcox Co. .... 7		McCarthy, T. R. .... 44	Safety Car Heating & Lighting Co. .... 7
Baker, Howard H. & Co. .... 52		McCurdy, Geo. L. .... 40	Scherzer Rolling Lift Bridge Co. .... 52
Bertram Engine Works Co., Ltd. .... 37	General Electric Co. .... 52	McMyler Mfg. Co. .... *	Schrader's Son, A. .... 2
Blake, Geo. F., Mfg. Co. .... 37	Georgian Bay Engineering Wks. * ..	MacDonald, Ray G. .... *	Shaw, Warren, Cady & Oakes. .... 44
Boland, J. J. .... 44	Gilchrist, Albert J. .... 44	Marine Iron Co., Bay City, Mich. .... 3	Shelby Steel Tube Co. .... *
Bonner & Co., Wm. T. .... 44	Gilchrist & Co., C. P. .... 44	Marine Mfg. & Supply Co. .... *	Shippowners' Dry Dock Co. .... 37
Boston & Lockport Block Co. .... 35	Gould, Holding & Masten .... 44	Martin-Barriss Co. .... 39	Smith & Son, Abram .... 43
Boston Steamship Co. .... 41	Great Lakes Engineering Works 14	Maryland Steel Co. .... 10	Smith Co., L. P. & J. A. .... 42
Bourne-Fuller Co. .... 35	Great Lakes Register. .... 40	Matteson & Drake .... 37	Smith Coal & Dock Co., Stanley B. .... 9
Bowers, L. M. & Co. .... 38		Mietz, Aug. .... *	Smith, Stanley B. & Co. .... 9
Brennann & Bros., G. H. .... 42	Hall, John B. .... 44	Milwaukee Dry Dock Co. .... 4	Smooth-On Mfg. Co. .... 38
Brown Hoisting Machinery Co., Inc. .... 2	Hanna & Co., M. A. .... 43	Mitchell & Co. .... 44	Standard Oil Co. .... 51
Buffalo Dredging Co. .... 42	Hawgood & Co., W. A. .... 44	Morse & Son, A. J. .... 50	Starke Dredge & Dock Co., C. H. .... 43
Buffalo Dry Dock Co. .... 4	Helm & Co., D. T. .... 44	Mosher Water-Tube Boiler Co. .... 39	Stirling Co. .... 9
	Hickler Bros. .... 42	Moulton Steering Engine Co. .... 38	Stratford Oakum Co., Geo. .... 2
	Holmes, Samuel .... 44		Sturtevant, B. F. Co. .... 52
Camden Anchor-Rockland Machinery Co. .... †	Holzappel's American Compositions Co. .... 38	Nacey & Hynd .... 45	Sullivan, M. .... 43
Carbolineum Wood Preserving Co. .... 40	Host, Dustin & Kelley. .... 44	New Jersey Zinc Co. .... 45	Sullivan & Co. .... 44
Chase Machine Co. .... 11	Hunt & Co., Robert W. .... 45	Newport News Ship Building & Dry Dock Co. .... 6	Superior Ship Building Co. .... 4
Chicago & Great Lakes Dredge & Dock Co. .... 42	Hutchinson & Co. .... 44	New York & Cuba Mail S. S. Co. .... 41	
Chicago Ship Building Co. .... 4	Hyde Windlass Co. .... 52	New York Shipbuilding Co. .... 12	Taylor Water-Tube Boiler Co. .... 39
Cleveland City Forge & Iron Co. .... 50		Northwestern Steam Boiler & Mfg Co. .... 38	Thropp, J. E. & Sons Co. .... 50
Continental Iron Works .... 2	International Mercantile Marine Co. .... 41		Trout, H. G. .... 36
Cory, Chas. & Son. .... 50			Truscott Boat Mfg Co. .... 51
Cowing, John P. .... 5	Jenkins Brothers. .... 52		
Craig Ship Building Co. .... 5	Jenks Ship Building Co. .... 5		
Cramp, Wm. & Sons, S. & E. B. Co. .... 8			
Crandall & Son, H. I. .... 3			
Cranie Co. .... 30-40			
Dake Engine Co. .... 38		Parker Bros. Co. .... 44	United Fruit Co. .... 41
Dearborn Drug & Chemical Wks. 11		Peck, Chas. E. & W. F. .... 40	Upson-Walton Co. .... 52
Dearborn Water Tube Boiler Co. .... 13		Penberthy Injector Co. .... 3	
Delaware, Belleville & Co. .... 35	Kahnweiler's Sons, David .... 50	Perfection Broom Co. .... 11	Walker, Thomas & Son. .... 35
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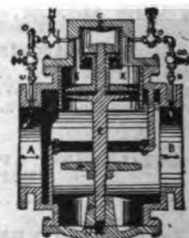
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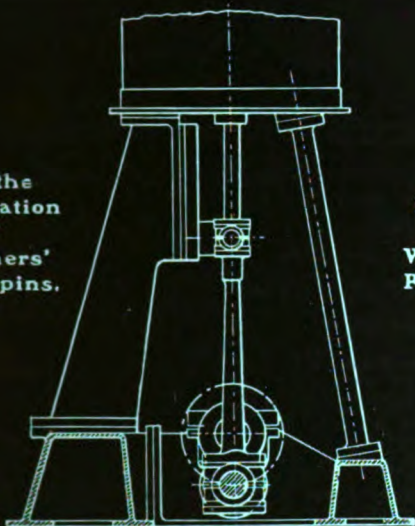
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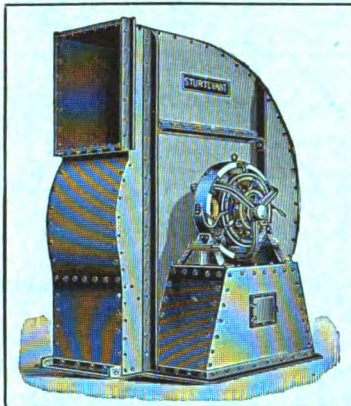
Eastward	Arrive from West	Depart East
No. 18, Southwestern Limited .....	.....	*1:50 a.m.
No. 22, Lake Shore Limited .....	*2:12 a.m.	*2:20 a.m.
No. 20, Chicago and Cleveland Exp. ....	*7:20 a.m.	.....
No. 28, New York and Boston Exp. ....	*7:40 a.m.	*8:00 a.m.
No. 40, Toledo and Buffalo Accom. ..	†10:00 a.m.	†10:30 a.m.
No. 32, Fast Mail .....	*11:25 a.m.	*11:30 a.m.
No. 48, Accommodation via Sandusky ..	†1:40 p.m.	.....
No. 42, Boston-New York Express ..	.....	*11:45 a.m.
No. 44, Cleveland and New York Spl. ....	.....	*3:00 p.m.
No. 46, Southwestern Express .....	.....	*3:10 p.m.
No. 116, Ashtabula Accommodation. ....	.....	†4:30 p.m.
No. 6, Limited Fast Mail .....	*5:40 p.m.	*5:45 p.m.
No. 26, 20th Century Limited .....	*7:40 p.m.	*7:43 p.m.
No. 10, Chicago, N.Y. & Boston Spl. ....	*7:30 p.m.	*7:50 p.m.
No. 16, New England Express .....	*10:30 p.m.	*10:35 p.m.
No. 2, Day Express .....	†9:10 p.m.	†9:25 p.m.
No. 126, Norwalk Accommodation ..	†7:55 a.m.	.....
Westward	Arrive from East	Depart West
No. 7, Exposition Limited .....	*12:50 a.m.	.....
No. 11, Southwestern Limited .....	*2:55 a.m.	.....
No. 9, Day Express .....	.....	†6:00 a.m.
No. 15, Boston and Chicago Special. ....	*3:10 a.m.	*3:15 a.m.
No. 19, Lake Shore Limited .....	*7:15 a.m.	*7:25 a.m.
No. 23, Western Express .....	*10:30 a.m.	*10:35 a.m.
No. 29, Southwestern Special .....	†11:10 a.m.	.....
No. 33, Southwestern Express .....	*12:25 p.m.	.....
No. 133, Cleveland and Detroit Exp. ....	.....	*12:45 p.m.
No. 47, Accommodation .....	†11:00 a.m.	†3:00 p.m.
No. 141, Sandusky Accommodation. ....	.....	†3:10 p.m.
No. 43, Fast Mail .....	*4:35 p.m.	*4:40 p.m.
No. 127, Norwalk Accommodation ..	.....	†5:10 p.m.
No. 37, Pacific Express .....	*6:50 p.m.	*7:20 p.m.
No. 3, Fast Mail Limited .....	*10:50 p.m.	*10:55 p.m.
No. 115, Ashtabula Accommodation. ....	*8:30 a.m.	.....

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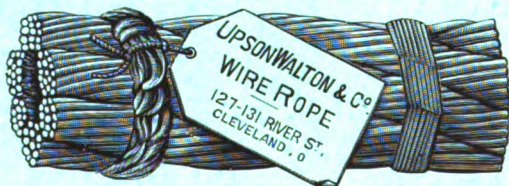
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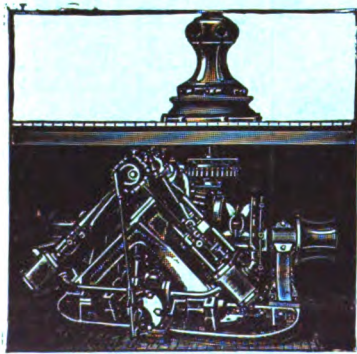
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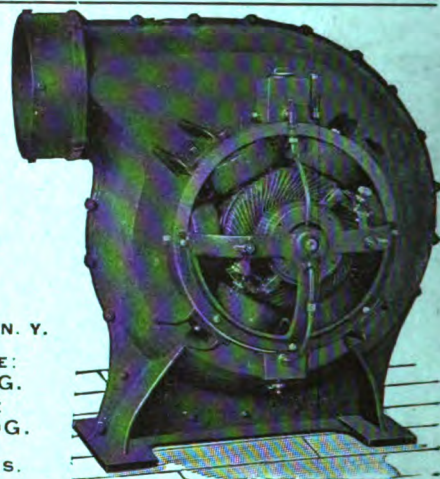
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